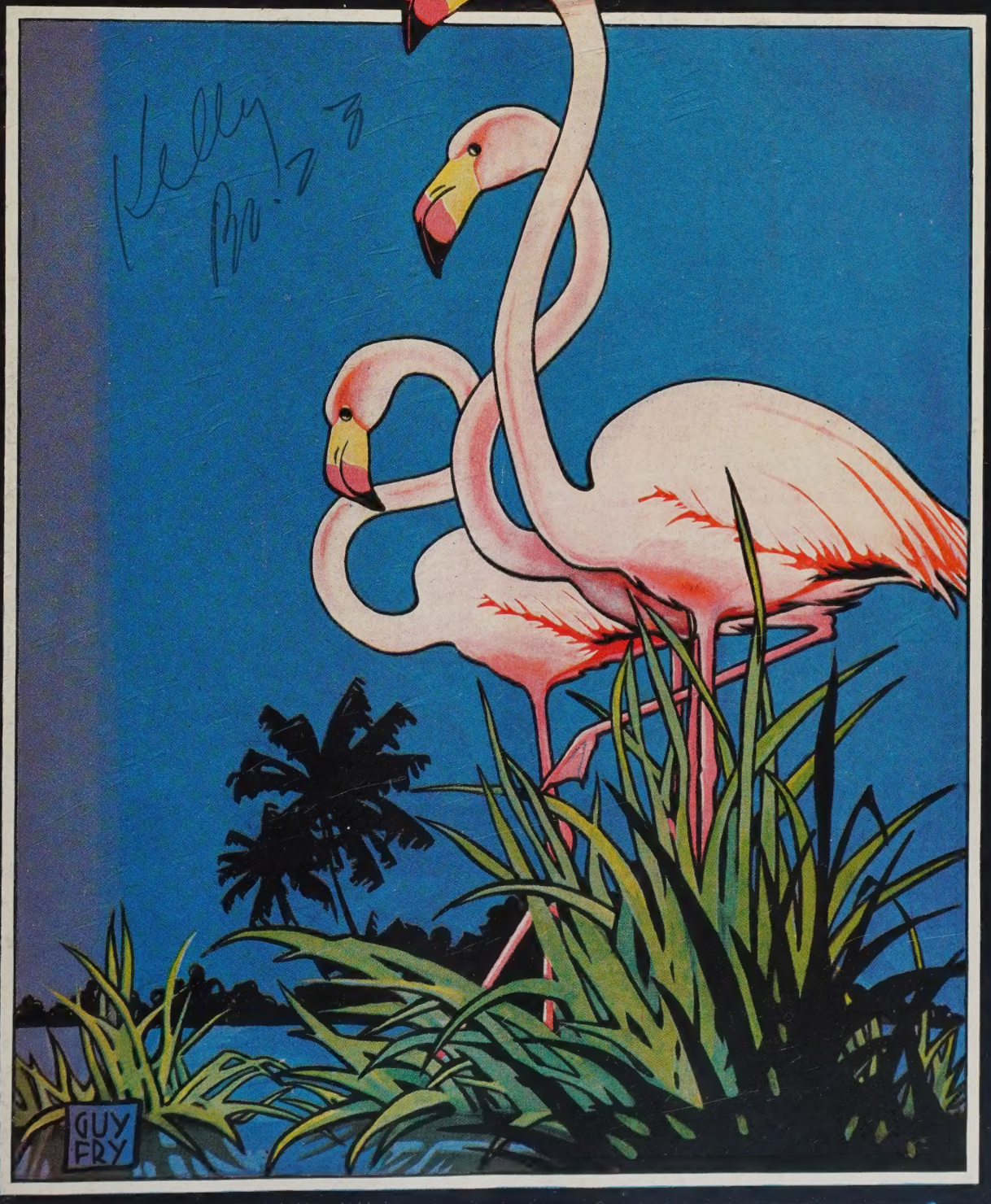
NATURE MAGAZINE



DECEMBER 1931 35¢ VOL. 18, NO. 6

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by R. BRUCE HORSFALL

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This page shows the actual size of the Book. The pictures, size 2½ x 3½, shown here in black and white, are reproduced in full color. The Book also has a full page frontispiece of The American Eagle.

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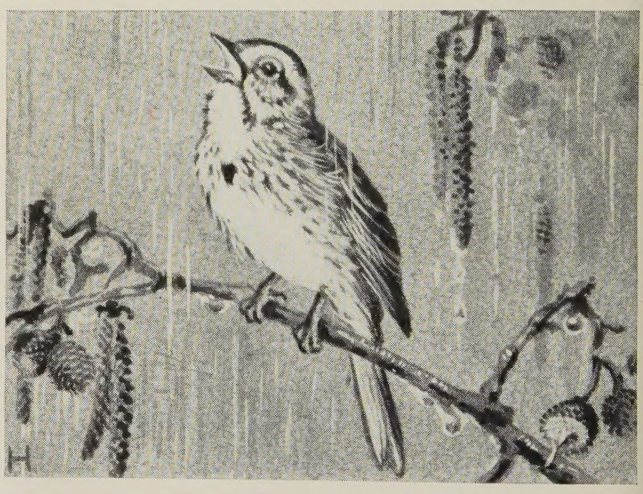

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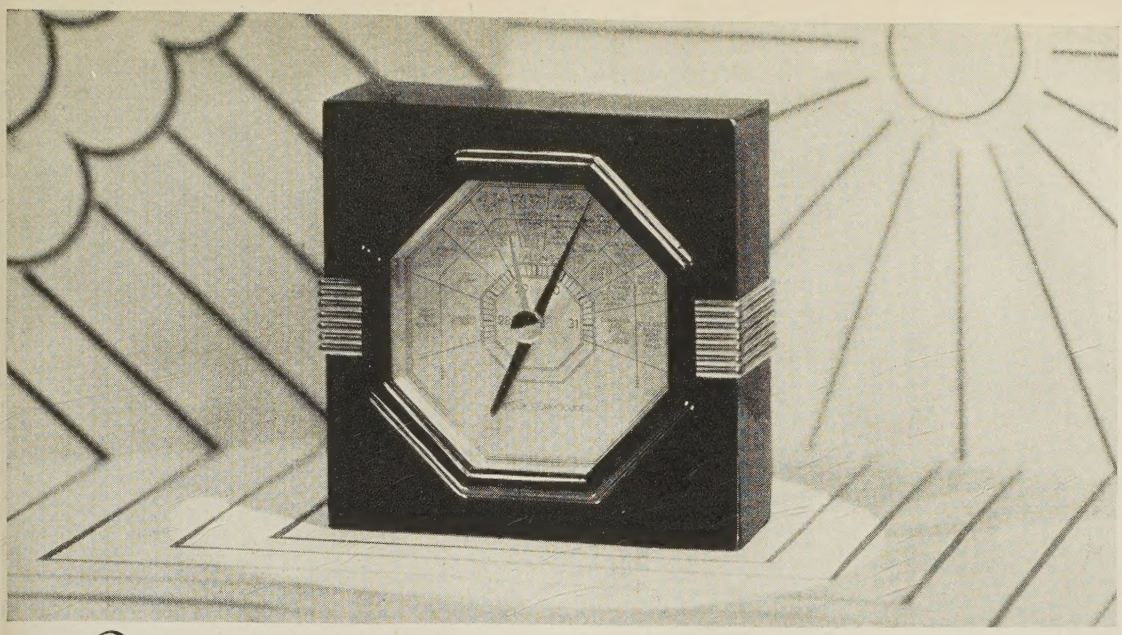

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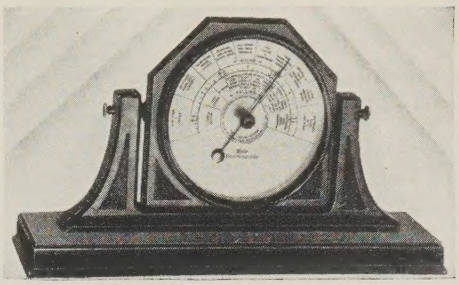

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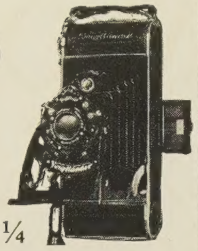

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How to "Take" Your Christmas Tree

Pictures of the tree in all its scintillating beauty are easy to make. If the tree happens to be well illuminated by the light that comes through windows, it can be photographed by giving a time exposure. Owing to the varied lighting conditions, it is not possible to state definitely how *much* exposure to give. The little manual of directions with your camera, however, will give you an idea as to the amount required for making most types of indoor pictures.

If you do not have a direction booklet with such a table, try a series of three exposures, ranging from 10 seconds to one minute. You will probably find that most of the negatives will be quite satisfactory. If the tree is placed directly in front of a window, best results will be secured by the flashlight method.

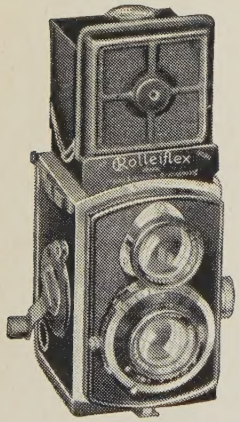
If the tree is not well illuminated, after all the window shades have been run up all the way, it can be readily photographed by flashlight, using a Photoflash Lamp. The picture can be made in this manner either in the daytime or at night.

We still have descriptive material on the Photoflash Lamp, if details concerning it are desired. Incidentally, we repeat, there is no danger from flame nor any annoyance from smoke or dust.

When making the picture of the tree, interest may be added by having a child or children sitting on the floor near it, playing with or examining gifts. Do *not* have them looking at the camera.

It is interesting to look back through a collection of Christmas tree pictures and note the changes made from year to year. Each year when we finish trimming the tree, we are *sure* that it is the best we have ever had, but after all the pictures will tell the real story.

Rolleiflex



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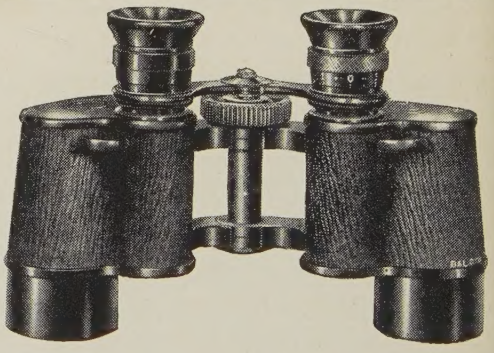

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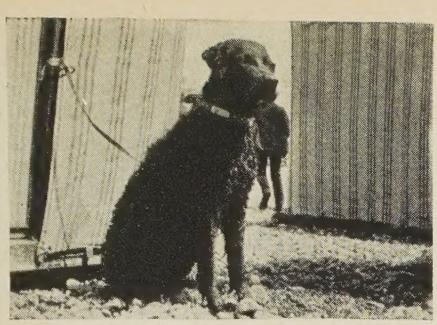

A VERY HUNGRY DOG

Constructive Criticism

Sure enough, here's the beast with a man dangling by the head, and in a few minutes the victim will be devoured! What tricks our camera lens will play if we give it a chance; or, after all, doesn't the lens record just what it sees?

Upon closer inspection it is easy to grasp the situation and see the deception in the picture. A friendly pet was anxiously, yet calmly, waiting for his master to unleash him from the tent pole, and a man happened to be passing several feet beyond. The camera shutter "clicked" at just the right time to give the effect shown. Often, we get so interested in the subject we want in our picture that we forget to watch the surroundings and objects to the rear of the principal figure.

At times, as perhaps in this case, someone will unknowingly intrude within our picture area just as we make the exposure. Many of us have, however, seen instances where an otherwise good picture is more or less spoiled by the photographer not looking beyond his subject from the position of the lens and getting its viewpoint. A homely telegraph pole rising directly from the head of a pretty girl, the sharply defined lines of a clapboarded side of a house in the rear of a group, the vertical lines of a porch railing as a background for a figure, and a lamp shade in a home portrait showing up as if it were a grotesque hat for our sitter, are a few examples the writer has noticed.

"Fuzzy" Pictures

In the excitement of making a picture one sometimes forgets that the camera should be held steady and the exposure lever pressed gently.

For when the camera is moved during exposure the whole picture image is "fuzzy" and disappointing.

While making a snapshot, the camera should be held firmly against the body. But in making a time exposure, a tripod, Kodapod, or other solid support is required.

Hints

When action in the subject demands a fast shutter speed or when the day is not very bright, the largest opening in the lens should be used. It is best for the beginner that the nearby subject be lighted either directly from the front or partially from the front and partially from the side. Do not point the camera toward the sun and allow its rays to shine into the camera.

Study the picture image in the finder. Select a view-point from which the subject appears properly lighted, and from which uninteresting or detracting objects in the rear are not visible.

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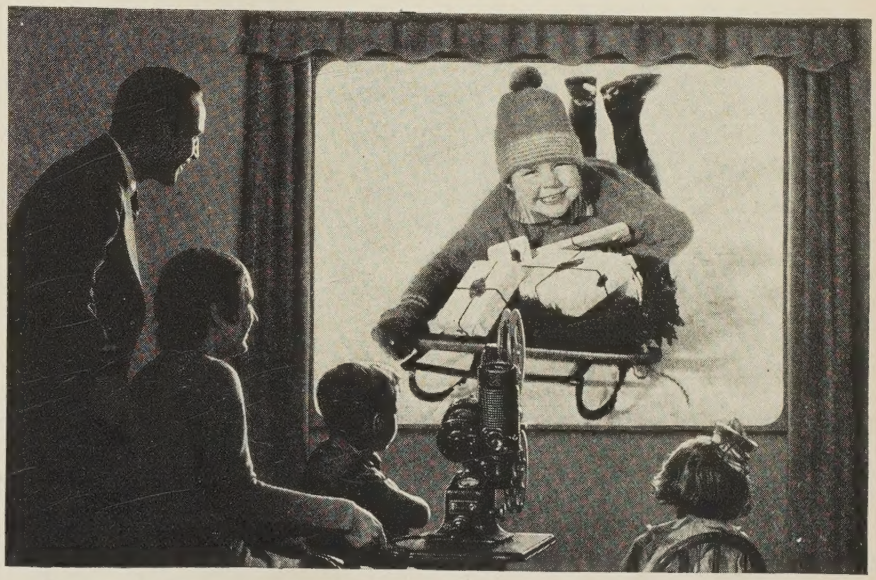

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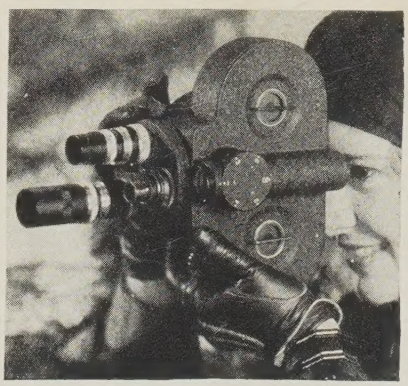

This Christmas, give a Filmo Personal Movie Camera and Projector. Let Filmo bring a lifetime of genuine pleasure to the one you think of first at Christmas. See a Filmo dealer today or write to us for complete literature. But hurry . . . the 25th is not far off. Filmo Cameras and Projectors may be equipped (under license from Eastman Kodak Company) for use of Kodacolor film for home movies in full color.

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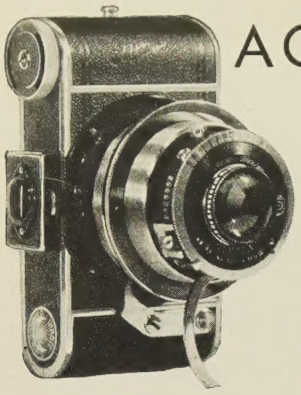

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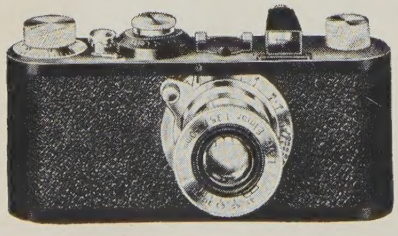

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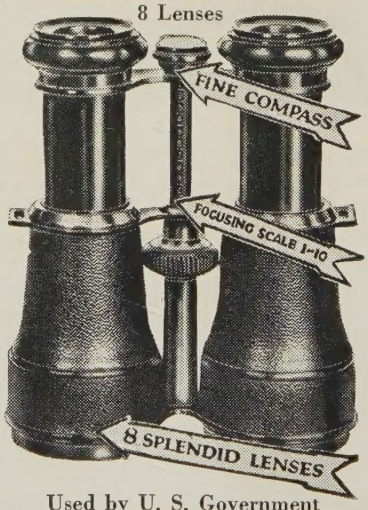

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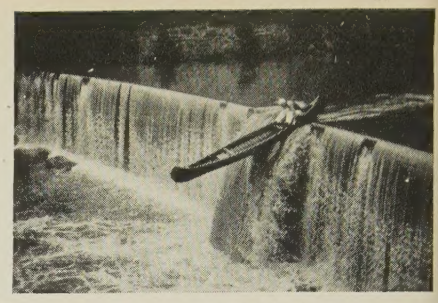

DID HE STAY ON TOP?

What Happened Next?

"Still" and "Movie"

The words "still" and "movie" were added to the nomenclature of photography soon after the introduction of the motion picture camera.

A "still," which is a single picture that can be made with any kind of camera, may suggest motion, but it cannot actually *show* the various stages of it. A single picture that contains a sharp image of a race horse, for example, made when the horse was trotting, at an instant when all four feet were off the ground, will suggest that the horse was moving, but it cannot show the movement because no single picture can contain a clearly defined image of more than one stage of motion.

A "movie" is actually a series of "stills" that can only be made with a camera that is specially designed for the purpose.

When we look at a "still" that suggests motion—a picture, let us say, of a canoeist shooting a waterfall—that was made at the instant when the bow of the canoe was projecting so far over the brink that nothing could prevent its downward plunge, we cannot help wondering what happened next, and the picture does not tell us.

Were we to look at a movie of the same subject, we would see what happened because the movie camera makes 16 pictures every second, no two of which, in the case of moving objects, are exactly alike. A movie of the canoe and its occupant would have recorded every stage of the trip over the falls, the splash when the canoe struck the water below, and would have shown whether the canoe had been upset or had landed safely, right side up, and started gliding onward downstream.

The work a movie camera performs is, therefore, very different from that which is performed by any other kind of camera. But, despite the fact that it records a consecutive series of incidents, instead of a single one, it is just as easy to make motion pictures with the efficient movie cameras now on the market as to make snapshots with a little box camera.

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NATURE IN PRINT

Conquest of Space

Just before going to press with this issue of NATURE MAGAZINE we received for review a copy of *The Conquest of Space*, by David Lasser, president of the American Interplanetary Society and author of our leading article in November. In this interesting volume Mr. Lasser gathers the data up to date on what has been done toward spatial travel, discussing first the problems of transportation, the character of the rockets which may be used, the theoretical trip through space and the various barriers now existing to successful interplanetary travel. It is a fascinating book which undoubtedly future generations will look back upon as an early and primitive work on spatial voyaging. The thoughts touched upon with necessary brevity by Mr. Lasser in the article in NATURE MAGAZINE are expanded in this present volume. So we urge those who have been intrigued by his article to acquaint themselves with this book, which is published by the Penguin Press and sells for three dollars.

By Vance Hoyt

Two interesting Nature books have come to us for review from Lothrop, Lee and Shepard Company of Boston. They are *Bar-Rac, the Biography of a Raccoon*, and *Malibu*, both by Vance Joseph Hoyt. The first is a story of the upbringing of a baby raccoon which had the run of the house and made full and entertaining use of it. It sheds much light on raccoon personality and the story is told with an understanding pen. In the other book Mr. Hoyt tells a Nature story fascinatingly. In it a naturalist who hunts with the camera figures prominently, and, with such a weapon, finds much of interest in the wild. The illustrations are done by Charles Livingston Bull. *Bar-Rac* sells for $1.50 and *Malibu* for $2.

About Birds

Another excellent booklet has been added to those already written by Dr. Charles Lincoln Edwards, head of the Nature Study Department of the Los Angeles schools. This last is entitled *Birds* and approaches the study of birds from an interesting and fundamental angle. The material contained in the pamphlet of 61 pages is basic and simply-presented for early bird study work. It is recommended for all who are concerned with Nature instruction. The publishers are the Hesperian Press, 2476 Glendower Place, Los Angeles.

Land Problems

Of particular interest to those who are concerned with the administration of lands is *Public and Semi-Public Lands of Connecticut* written by Philip Laurance Buttrick and published by the State of Connecticut for the State Geological and Natural History Survey. The report is available from George S. Godard, State Librarian, Hartford, Connecticut, for ten cents to citizens of the state or one dollar to others.

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Again Nature Magazine parties have been arranged, and will be strictly limited as to members. Mr. Tom Gill, former Chief of the Public Relations Division of the United States Forest Service, who is well acquainted with both individuals and locations in the Caribbean region, will be in charge. These two cruises are travel events of supreme importance . . . with visits to most worthwhile Caribbean ports.

For further information about the Nature Magazine Cruises write to the Director of Field Trips, Nature Magazine, 1214 16th Street, N. W. Washington, D. C.

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C U N A R D

Tropical Forests

Doubtlessly many of our readers remember a most interesting account in our November, 1930, issue of a "Night by a Jungle Lagoon," written by Tom Gill. Mr. Gill, we explained in that issue, has spent much time in tropical research, but we did not explain at that time that his explorations were for the purpose of completing a survey of the forest resources of the countries bordering on the Caribbean Sea.

This survey has now been completed, and Mr. Gill has just finished writing a book, *Tropical Forests of the Caribbean,* published by the Tropical Plant Research Foundation, in which he tells, in a most readable and interesting style, of the results of his investigation.

In addition to chapters on the past and present use of wood in these Caribbean countries and the forestry outlook for the future, there are chapters devoted to the individual countries, discussing in detail their forest resources, their forest laws, and the extent to which devastation has already proceeded.

There is also a chapter in which Mr. Gill discusses the difficulties arising from lack of standardization in common names of trees, and in which he traces the origin of the different native names given to single species.

Mr. Gill, in addition to being the author of "Night by a Jungle Lagoon," has written numerous other articles and stories and is the Forester for the Charles Lathrop Pack Forestry Trust. He was formerly in charge of the public education activities of the United States Forest Service, and is a Senior Member of the Society of American Foresters.

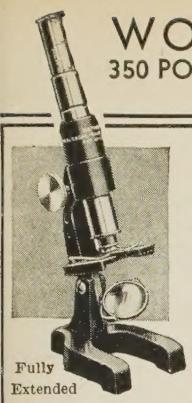
This edition of the book is limited to one thousand copies, each one numbered, and the price is $5.00. It may be obtained from the Tropical Plant Research Foundation, McLachlen Bank Building, Washington, D. C.—N. D.

Brainerd Mission

Here is a book that is different and that takes us back to the United States of more than a century ago when the Cherokee was an eastern Indian. It tells a fascinating story of the missionaries sent to this tribe and who formed the Brainerd Mission. Born within a few miles of the now almost forgotten site of this settlement, which aided the Cherokee on his way to agricultural achievement and, perhaps, to Christianity, Robert Sparks Walker has long cherished the desire to write the story. Aided to this end by Sherman Sanders, he delved into the records, the original correspondence from and to the mission, and out of his researches has come a volume entitled *Torchlights to the Cherokees,* a unique historical contribution. The book is published by Macmillan and listed at three dollars.

Rolleiflex

One of the neatest little cameras that has recently come to our attention is the Rolleiflex. Space does not permit describing its clever gadgets but we will gladly send information to readers interested.



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Virtually the classic in its field, *Handbook of Nature Study* by the late Anna Botsford Comstock has now been issued in a revised edition. This is the twenty-second edition of this valuable book, which of course should be on the library shelves of every school that can scrape up four dollars to pay for it. It is not limited, however, to school use because it is of immense value to anyone concerned with instruction in Nature study. This volume is available from the Comstock Publishing Company, Cornell Heights, Ithaca, New York.

Birds of Paradise

New Guinea, second largest island in the world, is still much a land of mystery. Its native tribes are still primitive with, here and there, a dash of cannibalism. Much of what the island holds yet remains to be found and told. But it does hold birds of paradise, comparatively few of which have been brought out to find places in museums and zoological parks. Bringing them out is accomplished only through the surmounting of tremendous difficulties and the encountering of unknown dangers. But, as Lee S. Crandall, Curator of Birds at the New York Zoological Park, says in his foreword to his book, *Paradise Quest,* "fortunately, a naturalist is not supposed to be practical". So he urged upon the directors of the New York Zoological Society an expedition into the trackless wilds of New Guinea to gather a collection of the glorious birds. The story of this perilous trip is told simply and fascinatingly in his book on the successful quest. If you are interested in Nature, in adventure and in far places, don't fail to read it. It is published by Scribner and listed at $3.50.

Wild Bird Guests

One of the best and most popular conservation books ever written, *Wild Bird Guests,* by Ernest Harold Baynes, has recently gone into its sixth printing, and is still as valuable both to adults and children as the day it was written. It is, by and large, a plea for the birds which sets forth the leading economic, aesthetic and moral reasons for their protection, and contains full directions for the organization and programs of bird clubs. Rich with avian anecdote, drawn from the wide experience of Mr. Baynes, it is a most readable work which carries a host of usable information. To even the most interested of bird lovers it brings new conceptions of the world of feathers. It is priced at $2.50 by E. P. Dutton and Company, New York.

An Ancient Tree

If age may be considered synonymous with wisdom, and if trees could acquire wisdom, then the giant redwoods of California certainly would gain first place. Allen Chaffee feels that both are possible and that, at least, a great sequoia may be aptly taken as the central figure of a Nature story. So, in *The Forest Giant,* he tells the story of what this great tree has seen as the centuries have passed. The book is simply written for the younger generation from nine years up. It is published by Milton Bradley Company, Springfield, Mass., and sells for two dollars.

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To Stimulate Public Interest in Every Phase of Nature and the Out-Of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

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MERCY FOR WILD CREATURES

An Editorial

At this season, when over all the world the birth-time of the Great Teacher is being celebrated, it is particularly fitting that we should examine our relations to the world about us and to its inhabitants. Christ taught love and mercy as the keynotes to human conduct, and there is ample evidence that the benefits of these qualities were to be extended to all creatures that are our fellow-tenants on the earth we presume to call our own, but on which, with them, we are but transient guests.

The love for animals is one of the great gifts that come to us in babyhood. As little children we turn to the dog with the same trust and affection that we give to brother or sister, and it is well that we never lose entirely this heaven-born love for our neighbors of the wild. Fortunate indeed are those who take fast hold on this precious heritage that comes in youth, and so cherish it that it grows to be an absorbing passion. For therein abides a source of inspiration and peace unknown and unattainable to those who have neglected their great gift.

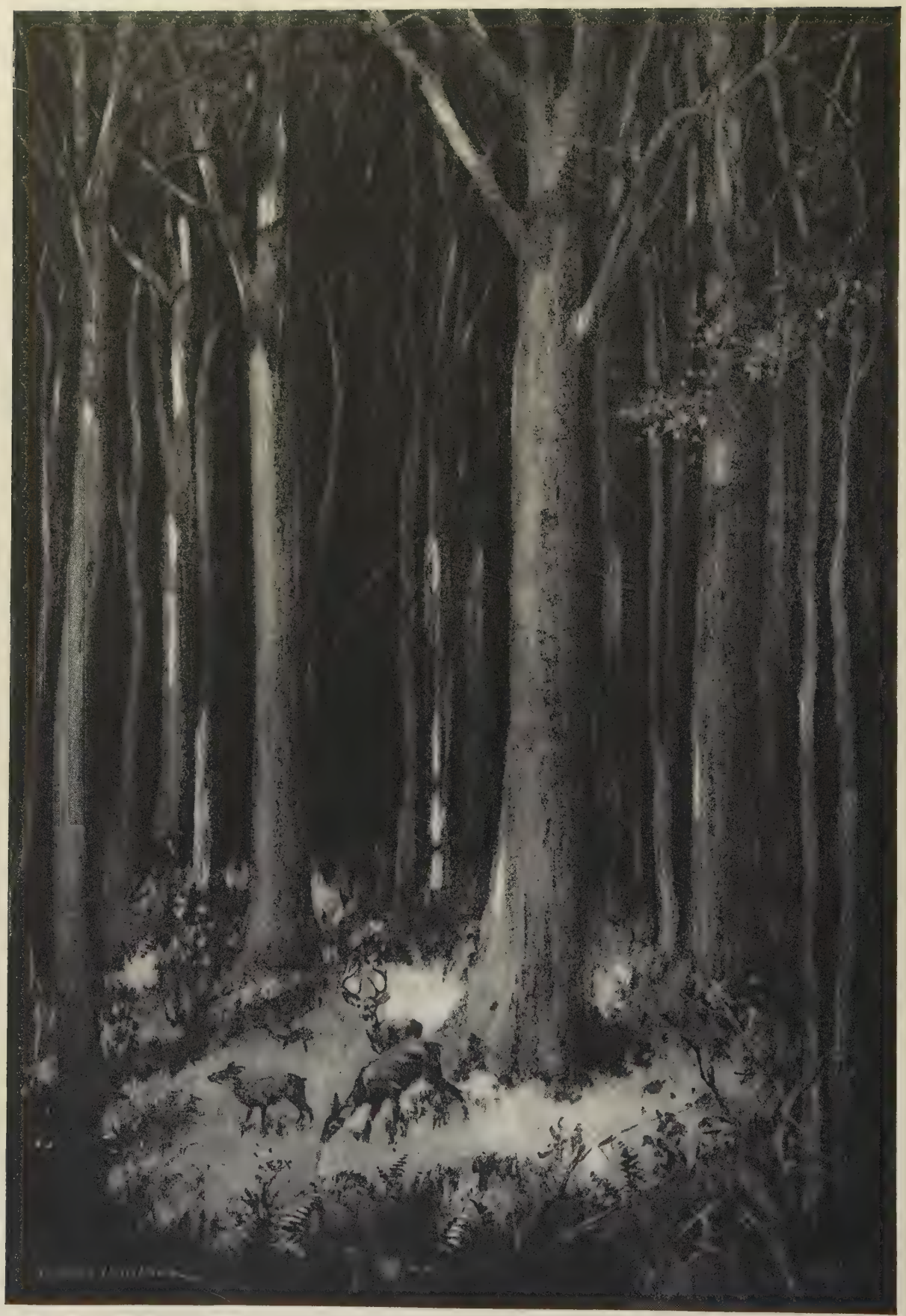
But as we look about us we are conscious that man's relations with his fellow creatures are far from perfect. In his feverish haste to acquire material things he has wandered far from the appointed paths. The growing scarcity of the wild creatures most eloquently voices their need for merciful treatment. As man has spread over the earth, his powers for destruction have multiplied. Vanity, avarice, love of ease, craze for sport, all actively fostered by an increasing ability and will to invent engines of destruction, and by an ever-growing demand that these yield a money profit, have conspired to cause an intolerable toll to be levied on our wild neighbors, ever hard-pressed by increasing occupation of their homes.

Our fur-bearers are an outstanding example of a persecuted race. The skins of wild animals, originally utilized by primitive man for his protection, are now largely used for ornament. As the regular sources of supply for raw material for the industry decrease, the uttermost parts of the earth are being searched for this commodity, and hundreds of species that only a few years ago were not considered legitimate game now yield their lives to fill the insatiable maw of commerce.

But friends of the animals, and they are of many schools, are working to help them. Some even contend that man should not wear the skins of wild animals, nor eat their flesh; some oppose their destruction on economic grounds; traps and poison are fought relentlessly; the humane societies, somewhat tardily, have taken up the cause of the wild creature. One association fights the steel trap, and has succeeded in outlawing it in at least one state by popular vote, an indication of a healthy and enlightened public sentiment for humane treatment of wild animals. Fur-farming, or the raising of fur animals under conditions of semi-domestication, is receiving attention. All these movements help the wild creature in varying degrees.

In this issue appear three articles that should appeal to all those who have the cause of our wild brothers at heart. One, written by a man long and well-known for his unselfish and unalloyed championship of wild life, takes for his theme, in what was probably the last article he ever penned, the master word in man's relation to wild animals—Love. The second author, also no longer with us, chooses for his text the actual case of a man caught in a trap intended for a bear, and has given us a vivid picture of the suffering that results every time an animal puts its foot into a steel trap. The third, written from a woman's standpoint, advocates the use of skins of animals raised for the purpose, and of those whose flesh also is utilized. This will appeal to many women who realize their tremendous responsibility in the threatened extinction of a constantly increasing list of wild creatures on which the fur-trade has laid its hand. The very growth of the relatively new phase of fur-farming affords an accurate index to the need of the wild animals for protection, for it was born of the necessity of maintaining an industry that was fast destroying its own capital stock. To those wearers of furs to whom this realization has come, but who cannot as yet meet fully their responsibility, the use of substitute furs should make a strong appeal.

Help from all who love wild life, and who have come to realize the great gains in esthetic and moral values that come to those who espouse its cause, was never more needed than now, when commercialism in many guises presses ever more relentlessly on all our wild creatures.



LAUGH AT MIDNIGHT IN THE EMPTY SOLEMN WOODS AND
EVERY SLEEPING BOLE WILL BREAK INTO LAUGHTER WITH YOU

NATURE MAGAZINE

VOLUME 18 DECEMBER · 1931 NUMBER 6

THE "MASTER WORD"

BY DALLAS LORE SHARP

ILLUSTRATED BY R. BRUCE HORSFALL

This is the first of two parts of a remarkable essay in which the late beloved writer-naturalist sought to set on paper a philosophy of the world of Nature. So far as we know this is the last unpublished work of any length by Dr. Sharp. The second part of the essay will appear in January.

"WE BE of one blood, ye and I," were the "Master Words" of the Jungle People. They are the Master Words of all people, in and out of the Jungle. Between the blood of men and beasts the chemists find a difference, the hemoglobin in the blood of each species crystallizing after its kind; but try the acid test on the thicker, redder stuff of their circumstances, their affections, and their fates, and who can distinguish a difference, except in color, between the crystalline soul of a mongrel and the soul of a man? We be of one blood, we who live and love and die.

On the platform of the Omaha railroad station some time ago I saw a portly gentleman exercising the homeliest, purest-bred of Boston terriers. I have never seen a more pathetic dog. Her little traveling house on a truck close by the baggage car of our waiting train was literally a-flutter with certificates and tags and permits, showing that she had been duly fumigated, inspected, tested and passed for hoof-and-mouth disease by the authorities in California, Nevada and Utah. Having just come through that horrid ordeal myself, I knew something of what the many passports on the kennel meant to both of the travelers.

As the whistle blew the portly gentleman gathered the broken, wheezy, pop-eyed old thing in his arms and murmured to her as she kissed his face, "It won't be long now, old girl. We'll soon be home."

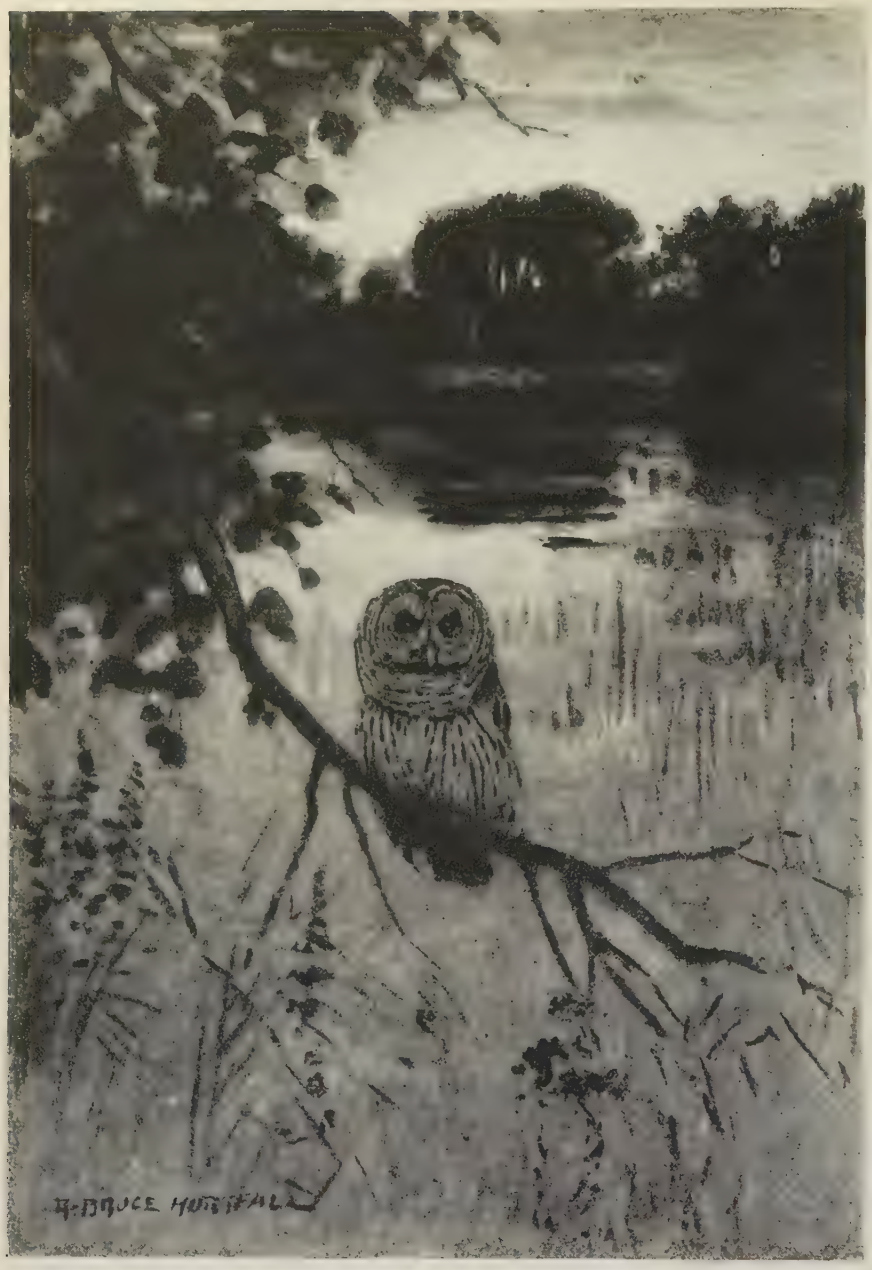
"Isn't it strange," I said to him inanely, as I watched him fasten the door of her house and shove it into the baggage car,—"Isn't it strange, this love of men and dogs!"

"Yes," he replied between his teeth, "I'd go through Hell for this one. But—never again!"

It isn't necessary to go again. Whoever makes that journey once has the Master Word for both Hell and Heaven and for this mixed world of the two. Under the microscope we may detect a difference in the behavior of the hemin in the blood of men and beasts, but out under the sun and the stars, where blood runs red and free, it behaves in portly gentlemen and in old Boston terriers very much as it does in young ones—of every species, the earth around.

Science tells us that there are certain hormones, prime movers, in our protoplasm which determine all that is individual and different in us. Observation, on the other hand, makes it plain that circumstances in common throng us, common hopes and fears, common needs and desires possess us, which compel us toward a life in common and a language in common that only wants a Master Word. That I have inherited the biology of all of the ages, back to the earliest protozoan, I accept with awe and with what humility I can, remembering how prodigiously varied and interesting is my ancestral line. But that is not the extent of my heritage. I have inherited the same planet with these my kin, all the ills that their flesh is heir to, as well as all of their fears. If, coming after them, I have been granted a larger portion than they of spirit, or soul, I shall know it only by a larger sympathy and sharing with them, and a larger apprehension of our several destinies in the single, universal plan.

I can scarcely remember the time when I was not consciously sharing life with some cat or dog or runt pig or broken-winged pigeon, or with some wild crow or coon or 'possum to whom I was trying to teach the Master Word. All the while it was they who were teaching it to me, as it was Baloo, the old bear, who taught it to Mowgli. What a dull pupil they had in me! I learned to hiss like the puff adder; to caw like the crow; to whinny like the coon; to croak like the big bull-frog. But



" . . . AND BRING THE BARRED OWL, HOOT FOR HOOT, THROUGH THE DUSK OF THE GUM SWAMP TO STARE AND CLACK HIS BEAK . . ."

none of these was the Word. I could call the quail to me, and make the wild drake answer me, and bring the barred owl, hoot for hoot, through the dusk of the gum swamp to stare and clack his beak at me, though I did not yet know the Master Word.

It was an incident in my early boyhood, an accident that I witnessed in the orderly paths of the woods, which gave me a clew to the Word by suddenly showing me how human all wild life is, or how wild all human life is, and how natural for every tongue to use the Master Word. Like all great teaching it was incidental, a turn from the ordinary, in one of life's rare moments when the soul can understand.

A red squirrel was traveling the tall pines overhead. Flustered by my following him on the ground below, or, more likely, distracted with curiosity about me, he carelessly leaped from the brittle tip of a dead limb extending from his tree when it snapped off. He grabbed at the broken stub, missed it, and, wildly clutching at the empty air, plunged to the earth with a sickening thud at my feet.

I thought the earth recoiled. A strange horror thrilled me, as if the fall had happened, or should have happened, to me. Accidents are human. I had never seen one in the woods before. A convulsive kick, a bubble of blood in the nostrils, and the little thing lay limp in my hand, a victim of faults so utterly my own as to make me feel faint. Then another feeling thrilled me. At the touch of the warm body in my hand I became conscious of a new relationship, a new sympathy for the earth and all of its valiant, feeble clay. It was only a squirrel in my hand. Yet the circumstances now attending it wrapped the little form in all the fearful pomp and solemn ceremony which I had seen in the train of human death. I was only a child, and could put nothing of all this into words. Yet what else meant my childish longing to give that squirrel a church funeral?

The highway is full of moving cars. Now and then we see an upturned truck in a field, a twisted thing being towed to a garage, a group of machines and men at some splintered gap in the fence. But they are gone when you return. A new white plank replaces the splintered one. You can hardly tell through which panel the car plunged. Faster still are the wrecks cleared from off the wild highways—a tuft of rabbit hair, the tipped robin's nest, the prints of an owl's wings on the snow. Nothing more, though now and then you come upon a little pile of bones. I have driven from Boston to Santa Barbara without being witness to a single automobile accident. I might wander as far along the wild trails without seeing one happen to bird or beast. Yet tragedy is there. The sunny fields and the silent, shadowy forest are full of it. On the motor highways dead birds and animals almost mark the miles.

As we do not confuse the wisdom of Nature and that of her human children, neither ought we in the case of her other children. The skills, purposes, and systems of the hive bees confound us. Yet where is there more

tragedy on a summer day than in a hive of bees? We derive our powers from a common source notwithstanding their inequalities. More things unite life than divide it. The instincts of the animals, so amazingly developed over our corresponding faculties, and our peculiar gifts and qualities so manifestly wanting in the animals, seem to bring us by different descents out of different clays into different worlds as subjects of different laws. But the biologist, no less than our own observation, tells that our laws and worlds and clays and descents are the same. We be of one blood. It is our language that separates us. We do not know the Master Word.

It is not, however, for lack of teachers. Perhaps love of Nature cannot be taught. But observation of Nature can be taught; and observation will soon show us how we still sell two sparrows for a farthing, and how God is still the only one to mark with much concern the sparrow's fall. No, the price of sparrows is going up. The Government, too, has taken notice of their fall. We have law enough. The Master Word is in the language of love. We American people lag far behind the English people in our love of Nature, because, perhaps, our pioneers are still our teachers, and not our poets. The natural savagery of the settler is but slowly changing into the sympathy of the neighbor among us in our new land hostile as to spaces and forces, though friendly enough as to soils and skies.

Sympathy is difficult stuff to handle. You cannot smear it over the branches as you can bird-lime. Nor can you post your farm and wood-lot with it as you do with no-gunning signs. Show a woodchuck sympathy and he will eat your beans. Try to free him from a trap and he will bite you, as my own dog did recently when I tried to pry a wedged bone out of his jaws. I finally had to take hold of him with heavy leather mittens. Yet that dog is pure understanding and instant response. All he asks of life is sympathy. But he wants it on his own terms. And he gives back in turn all he is in loving support.

Beside my dog and bees what a circle of dependent wild Nature I am at the centre of: flowers to be planted, trees to be trimmed, birds to be fed, forests to be guarded, winds to be harnessed, stars to be companioned and conversed with as they have been by lonely men across the ages.

The December wind is swirling the fine snow flakes past my study window, saying bitter things if I could hear. But my window is on the South, and is double to shut out the wind. There is no open fireplace in this upper south room, and so no boisterous laughter in the chimney. I could show still less love and understanding; could turn my back on the whole of winter and go to California. Suppose Whittier had done that? Then "the sun that brief December day" would never have risen at all.

> "Meanwhile we did our nightly chores,—
> Brought in the wood from out of doors,"

but hardly in California where wood is twenty-seven dollars a cord, and only chaparral roots at that! But see—

". . . AND, WILDLY CLUTCHING AT THE EMPTY AIR, PLUNGED TO THE EARTH . . ."

> "And through the glass the clothes-line posts
> Looked in like tall and sheeted ghosts.
>
> The well-curb had a Chinese roof;
> And even the long sweep, high aloof,
> In its slant splendor, seemed to tell,
> Of Pisa's leaning miracle"—

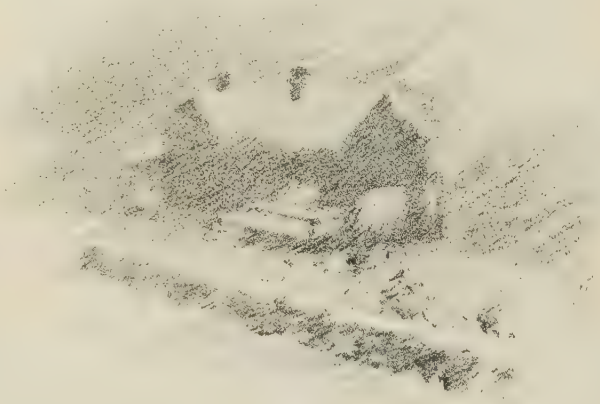
in California? Never! Never could such wonderful things happen in a snowstorm in California to a poet who had turned his back sourly on the weather of Massachusetts. This poet understood the language of winter. He had the Master Word and could talk to storms.

Asks another poet—

> "Who has seen the wind?
> Neither you nor I."

But sailors have, or nearly have. All the sailors I know swear they have. Winds are living souls to sailors, great spirits who talk and shout and work, and sometimes loaf

at sea, who are loved and feared and known of sailors even better than their shipmates' souls. Shirking among the slapping sheets, or bellying every stitch of canvas from flying jib to spanker, the winds stand their trick on deck, at the wheel, and in the shrouds, a numerous, trained, obedient crew—when not in mutiny. Why should they not be visible to sailors who ship with them, and have the Master Word, and call them by their off-shore names?



"THE DECEMBER WIND IS SWIRLING THE WILD SNOWFLAKES PAST MY STUDY WINDOW . . ."

And so the ever blowing winds upon the prairie. Look at the eyes of the prairie people—eyes that see the winds tumbling the Russian thistles along the Kansas horizons, or skirling the snow, or whirling the sand-spouts over the wide Dakotas, or hanging poised on quivering wings above the burnt grass of Nebraska! The prairie would be intolerably lonely should the winds depart. And what was the crime of the Ancient Mariner?

> "And I had done a hellish thing,
> And it would work 'em woe;
> For all averr'd, I had kill'd the bird
> *That made the breeze to blow!*"

My hilltop in Hingham is so thronged with trees and stars and street lights, and honk of motors on the Country Way to Plymouth, and birds and neighbor houses and neighbor hills that I should hardly notice it if I never even *heard* the wind again. A copper weather vane on the peak of the barn, a relic of some sailor past, perhaps, or out of The Old Farmer's Almanack in which my rural forebears lived, is my only invitation to the winds, and I seldom look up to see who of them are coming. I have a tall flag pole, too, and a flag; but some one stole the halyard years ago, and there is no steeple-jack about the place to reeve a new one in the block at the top of the pole.

Along toward night in winter when the sky is dull and the earth blank and numb with cold, and I am alone by the fire, I sometimes cannot read for listening to the wind in the trees. They wrestle and twist the limbs; and if I go out they pinch and slap and jostle me, by no means in pure fun. Now and then in October they swoop down upon the orchard, trampling the red apples into the turf, and pitching at some decrepit tree, rend it horribly and leave it done for with its trampled fruit.

I have no sail for the wind to fill, no mill for the wind to turn, neither work nor word for it as it passes by. But suppose on the knoll I had an old Dutch mill with sweeps as long as a schooner's booms? That would be an invitation. The winds would understand that. And how they would love such a mill! And I would give them my corn to grind, and my wood to saw, and my water to pump. Then there would always be a breeze on Mullein Hill, a sky-high breeze in the lofty sweeps; or else there wouldn't, and I should want to know why. How soon I should learn the language of the wind! For every breeze that blew would stop on Mullein Hill to work or play and put me weather-wise.

The wind bloweth where it listeth; and no man knoweth whence it cometh, nor whither it goeth. But any man can detain it, and employ it, and parley with it in a language which, for neither of them, is very hard to learn.

So with every other wild tongue. There is a Master Word for them all. We go into the woods to hunt; or into the fields to learn; with singing when the day is fair; with sighing when our lot is sad; we go wearily at the end of the week for escape and rest. And we get what we go for. All we are, Nature is. Her needs and ours are the same. Speak to her with a gun and she will spit back with blood. Sing and she answers with singing. Laugh at midnight in the empty solemn woods and every sleeping bole will break into laughter with you.

To be concluded

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The second part of this fascinating, searching essay by the late Dr. Sharp will appear in January. Also in that issue will be an intriguing story of a jungle orphan pet by Tom Gill; another of the entertaining articles by Charles Fitzhugh Talman and many other features appropriate to the season and to the pages of Nature Magazine.

PAPA STORK AND THE YOUNGSTERS
He calmly surveys the world from his roof-tree while the babies pop up their heads, looking for food

WHEN A STORK FAMILY POSES

CONCERNING PICTURES FROM A ROOF-TREE

BY CARL A. NAETHER

PHOTOGRAPHS BY THE AUTHOR

THE FATHER BIRD ALIGHTS
Satisfied that all is safe, he comes home to scold the children for exposing themselves

HANS saw them first, high on the tiled roof of an old peasant house in the quaint village of Rosenfeld. You can always trust the bright eyes of a thirteen-year-old German boy to pick out everything unusual. And nothing would do but we must stop and try to photograph them. After all, storks do not happen in the range-finder every day. So we dismounted from our bicycles, on which we were leisurely travelling through Saxony, and watched, while the mother stork occasionally lifted her small white head with its long red beak over the edge of the huge nest as if to ask what these two strangers were doing gaping in the quiet village street.

It was at least fifteen minutes before the other stork, the male (so we were told later by the peasants living in the house), came flying slowly homewards, bearing food in his beak. It consisted doubtless of frogs and little snakes. He flew low, barely skimming the sharp ridges of the gay red roofs that jutted out everywhere among the fresh-green foliage of immense chestnut and linden trees. Of course, he headed straight for the nest, where his mate welcomed him with a strange clattering, as if he had been away from home for a long time. She rose from the nest and watched him feed the young, which must have been as yet very small, for we could discern only their little downy heads and short black beaks above the nest's edge. In a few minutes the meal was over; and then Papa Stork flew away as slowly and majestically as he had come, leaving to his mate the task of warming the youngsters once more.

Now that we knew definitely that there were young storks in the big nest, we decided to return in a few weeks when they would be much larger and perhaps also much livelier, in order to photograph not only the nest and its fascinating occupants, but, if possible, the parent birds also. Just then an old peasant—he must have been well past seventy—wearing wooden-soled slippers on his stockingless feet, emerged from one of

the neighboring houses. He had noticed our interest in the stork nest, and, seeing my camera, said:

"If you are planning to take a picture of the young in the nest, you'll have to climb the high roof and get as near them as possible."

"Won't the old storks fight us off the roof?" inquired Hans, who, anticipating an adventurous time atop the old brick dwelling, at once became enthusiastic over the old man's suggestion.

"I hardly think so, my boy, but you'll have to take your chance on that. But if you want a really good picture, you'll just have to get away up there close."

A FAMILY GATHERING HIGH ABOVE THE TOWN

Midst red roofs, peaceful fields and beautiful forests the storks, harbingers of good fortune, have settled down to raise their brood

Then, in answer to our eager questions, the white-haired old man told us that ever since 1890, when he and his wife had moved into the tiny gray-brick house, the stork nest had been there. Usually the birds would arrive at the end of April or at the beginning of May from far-away Africa where they winter, and would almost immediately proceed to repair the old nest with tree branches, pieces of paper, and other similar nesting material. The nest rested, he told us, on a big wagon wheel which the owner of the house had placed there in the hope of attracting just such long-billed tenants. For to have storks make their home on the roof of a house brings good fortune to its occupants, according to the earliest—and latest—traditions of the village folk in Saxony. Sometimes—the old man recalled the past—more than one pair of birds returned in the springtime to this spot. Perhaps they were the young with their parents. Then a vigorous fight in which long sharp bills and strong black and white wings played an important rôle ensued over the possession of the coveted nesting place. And always, only one pair remained but whether it was the same pair each season, the old peasant was not able to say. This was the only stork nest not only in the village of Rosenfeld but in all the villages within a radius of ten miles, he said. Hans wanted to know how many young there were in the nest. The old man thought there were three, that being the usual number hatched. One of the three youngsters, the smallest and weakest, is usually ejected from the nest long before the baby storks attain any considerable size. According to our informer's observations, it was very seldom that all three were reared to maturity, and there was but one brood each season.

Several weeks later Hans and I were again pedaling lustily in the shade of the beautiful chestnut trees that bordered both sides of the well-kept country highway that led to our nest. As we approached our destination, we could plainly see the young storks and decided to photograph them at once. To reach the top of the roof on which the nest was located, we first ascended the flat roof of a small adjoining house by means of a long ladder lent us by helpful peasants; then, using our hands and feet, we climbed the steep roof, which was covered thickly with dusty, withered moss and other roof plants that we clutched tightly in our effort to reach the ridge. Often the dried-up growth gave way, and we would slide all the way down and have to begin all over again. Hans, quicker and more agile than I, got to the top of the roof long before I did; there he held out his hands to pull me up. The view of the red-roofed village houses and of the surrounding green fields and forest was most attractive.

Once on top of the ridge, I cautiously edged closer to the large nest, which the old parent bird had left quickly

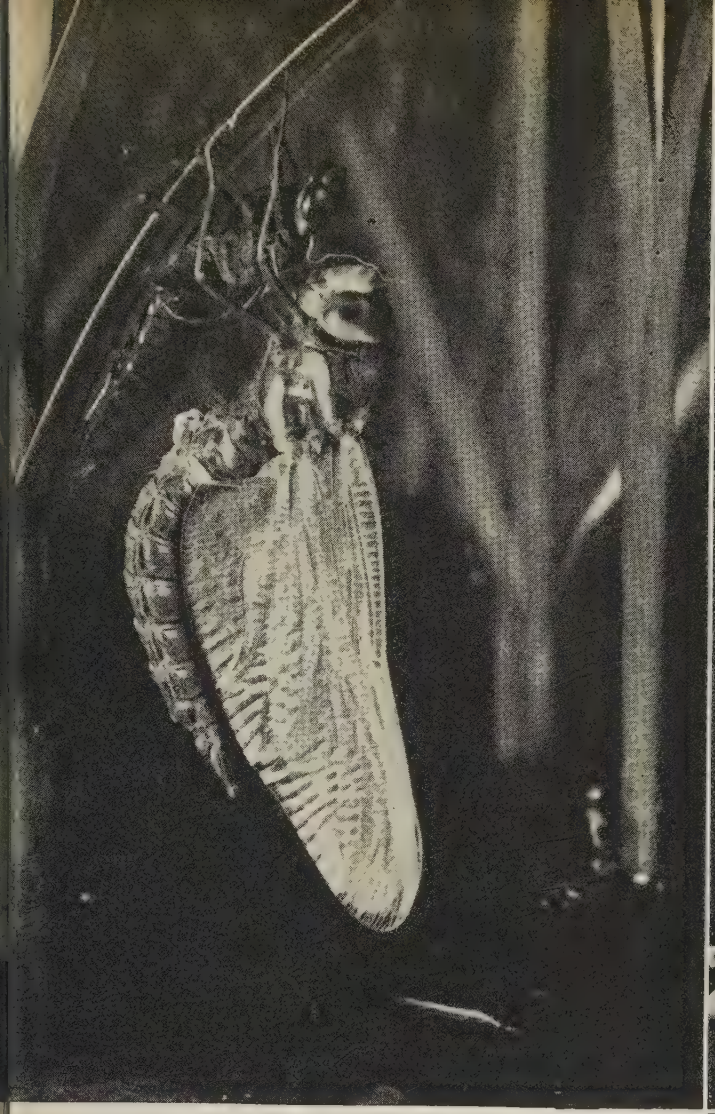
but still hesitatingly at our approach to fly to a nearby roof. According to the old peasant who had watched the storks come and go for over forty years, it was the male of the species. And while he stood there excitedly and at a loss to account for this sudden invasion of his airy, sunny home, I began to settle myself more securely on the ridge-pole so I might better watch the youngsters. The peasant had been right—there were three of them. In their downy grayish-white dress, with their big, but rather short and broad black beaks, they resembled young white swans. Two of them were approximately of the same size, whereas the third appeared to be small and puny. Perhaps it was his bad fortune to have been born several days later than his nest mates and he it would be to be cast out to his death. Though these peculiar looking young creatures, at first frightened by the noisy clattering of their anxious father, had bobbed down very quickly, they remained still for but a few moments. Soon they raised their silky little heads to stare at us. So unremittingly did the hot sun beat on their shadeless abode that all three gaped for air in a manner comparable to that of Hans and myself.

Having photographed the nest with the young, we turned our attention to Papa Stork, who, seeing that we neither disturbed the nest nor touched his children, but that we remained quiet, began to circle the nest. Finally, and to our great joy, he alighted on it clumsily, and still furious, began noisily to inform his offspring of the danger lurking on the roof. Undoubtedly they understood his harsh clatter perfectly, for they ducked their heads below the edge of the nest in immediate obedience. Having thus subdued his little ones, he belligerently faced us, persistent intruders of his airy domain, as if to say, "Well, now that you have a picture of my youngsters, go ahead. Here I am in my best fighting pose. Photograph me, only make haste and let us have this startling impromptu meeting over just as soon as possible, for when my wife returns, she will scold you severely for upsetting in so unexpected and unceremonious fashion the orderly routine of our high little home." We accommodated our angry host by taking his picture then and there.

Soon, however, father stork relaxed his stark mien, and regarded us in more friendly manner, though still watchful of every movement we made in our uncomfortable places on the sun-baked roof. The young birds, too, must have become aware of the change in their father's attitude, because they began to wriggle in the nest and to "come up" for air without being reprimanded for so doing. We took another snapshot of the stork family—in a friendlier pose. Hans then remarked, "If only the mother bird would come! We want her, too."

No sooner had the words been spoken than we saw her in the distance, flying slowly toward the nest. Afterwards, when she espied us in dangerous proximity to her home, she alighted in a nearby meadow. As if undecided what to do next in so real an emergency, she began to eat the food which she had brought for the young. There in the flower-bedecked meadow she paced to and fro on her long red legs for more than half an hour, while her faithful husband guarded the nest. At last she came, flapping high above the house in wide circles, her mate all the while calling to her, as if to say: "Just come home, Mary. There is no immediate danger. These strange beings up here won't harm our youngsters or us." But she flew away into another meadow where she apparently searched for more food—frogs, mice, and other stork delicacies. Now Hans and I, who had been on the roof more than an hour, began to grow impatient. Just as we were about to give up she came again, circled three or four times and finally, though very reluctantly, descended on the nest. Having our little camera in quick readiness, we immediately took a group picture of the entire stork family. Even though we had to wait a long time for this last pose, we were happy to get it and felt well repaid for the hours we spent in the broiling sun.

REPRODUCED FROM AN ORIGINAL PAINTING BY CARL KAPPSTEIN



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METAMORPHOSIS

In these remarkable photographs Ernst Krause of Berlin, Germany, has recorded the emergence of the dragon-fly from the ugly nymph to the beautiful, iridescent insect. To the left we see the fly appear, hang head down momentarily to rest, grasp its former case fully to emerge and drop its still-moist wings. Then, above, the body stretches and the wings dry and harden, and, finally, the lovely insect leaves its empty case behind and spreads its wings in all their shining, shimmering beauty.

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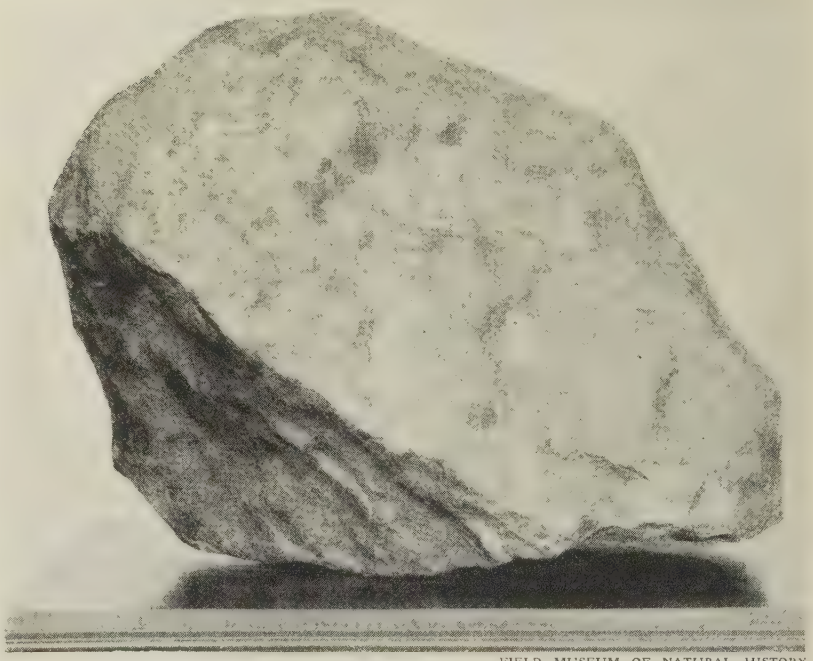
CASUAL VISITORS FROM AFAR

THE ROMANCE OF METEORITES

BY

CHARLES FITZHUGH TALMAN



FIELD MUSEUM OF NATURAL HISTORY

THIS VISITOR "DROPPED IN" DURING 1930

It fell near Paragould, Arkansas, on February 16. Weighing 820 pounds, it is the biggest *stony* meteorite in captivity

IN TIMES gone by, the fall of a meteorite was not considered nearly so strange an event as it is today. It was rare and inexplicable—hence a prodigy—but the old chronicles were full of prodigies. It was, some thought, the work of the gods—but what were the gods? Slightly magnified men, dwelling a few bowshots above the earth, who had their own human-like troubles and failings.

Today, in the light of scientific knowledge, it is one of the most wonderful, sensational, romantic events we can possibly imagine. A man of my acquaintance keeps on his desk a paper-weight, cut from a chunk of rock that fell one evening out of the sky. Science tells us that an hour before it fell the rock was a hundred thousand miles away from the earth. Two and a half hours before it fell it was as far away as the moon.

A few years earlier it may have been at the outskirts of the solar system, and in past ages it was possibly somewhere out in interstellar space; perhaps darting among the Pleiades, or swerving from its course under the gravitational attraction of Arcturus. It may, indeed, once have been part of Arcturus or of some other orb equally remote.

Next time you stand before a meteorite in a museum, try to realize the uncanny truth about it. Here is a material object that you can touch and handle, weigh and measure; but it is no child of Mother Earth. It came— and perhaps at no very distant date—from another part of the universe!

A meteorite is a meteor that has fallen upon our planet; but the vast majority of meteors never become meteorites. Many, however, are constantly entering the earth's atmosphere, where, mostly at heights ranging from fifty to seventy-five miles above the ground, their friction with the air generates so much heat that they emit light. Visible meteors are commonly called "shooting stars" (though of course they are

THE BACUBIRITO

A meteorite that fell in Sinaloa, Mexico, and weighs twenty-seven tons

YERKES OBSERVATORY

STREAKING ACROSS THE HEAVENS

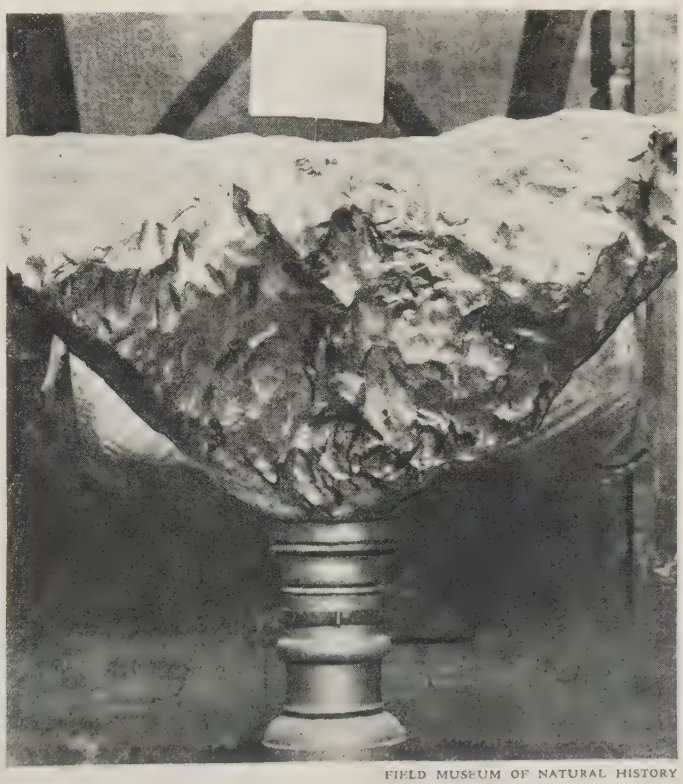
Stellar photographs often show such white streaks, representing meteors that have shot across the field while the plate was being exposed

not really stars) or, if very bright, "fire-balls." Those that burst in midair are sometimes termed "bolides." The study of meteors is known as "meteoric astronomy," and not as "meteorology," which is a term applied to the science of the atmosphere and the weather.

Celestial space must teem with meteors. According to a current estimate, about twenty million of them, bright enough to be visible to the naked eye, enter the atmosphere, on an average, every twenty-four hours. Their actual speed averages something like twenty-six miles a second, but as they approach the earth from all directions, and as the earth itself travels at a speed of about eighteen and one-half miles a second, their rates of locomotion relative to the air through which they pass vary widely. The slowest, however, move many times faster than the fastest rifle bullet.

Plunging at enormous speed through the atmosphere, the meteor suddenly turns entirely or in part to a cloud of glowing vapor far larger than the original body. This explains why we see so many meteors, despite the fact that few are bigger than a boy's marble, while many are no bigger than grains of sand. Most visible meteors are wholly consumed in the air, but those of exceptionally large size merely lose part of their surface material. These pass out again into space or fall to the earth.

If there were no atmosphere about the earth to burn up these flying missiles they would subject us to a continual fusillade, and probably few of us would live to tell the tale. Even a grain of sand moving at the speed of a meteor would kill a human being if it hit a vital spot. When, if ever, men conduct exploring expeditions on the surface of the moon they will need some still uninvented kind of armor to protect them from the incessant shower of meteorites falling upon that satellite, which has no atmosphere, or, at the most, one so attenuated as to afford no protection from these objects.



FIELD MUSEUM OF NATURAL HISTORY

ELEVEN TONS

This missile from the skies, now in the School of Mines, Mexico City, might have done considerable damage, had it landed in a heavily populated region

Besides preventing small meteors from reaching the earth, our atmosphere checks the speed of the big ones, so that, when they fall, they do not generally hit the ground much harder than would bodies of the same weight falling from the height of a few miles. While the largest come down with much violence, small specimens have been known to fall on a thin sheet of ice without breaking it.

Meteorites that cause damage on the earth

U. S. ARMY AIR CORPS

THE SCAR OF A CELESTIAL BOMBARDMENT

Meteor Crater, Arizona, seen from the air. It is three-quarters of a mile from rim to rim, and has trees on its sides 700 years old. Many attempts have been made to salvage the ore of the meteorite that struck here

are the rarest of exceptions, though such cases do occur from time to time. Buildings are occasionally hit and human beings have had narrow escapes from death. A meteorite crashed through the roof of a cottage in Scotland as recently as 1917. At Braunau, Bohemia, in 1847, one weighing nearly forty pounds fell in a room where some children were sleeping and covered them with débris, but did them no serious harm. At Charsonville, France, one fell on a road between two carters, throwing up the ground to a height of six feet. A few years ago four stones fell near a Negro funeral procession in Virginia, giving the mourners a bad scare but doing no damage.

That people have actually been killed by meteorites is altogether probable, but the recorded cases are all of early date, and the evidence concerning them is rather indefinite.

That a fall of meteorites *might* cause a colossal disaster was convincingly proved on June 30, 1908, when one or several of these bodies descended in the heart of a Siberian forest, so far from the beaten tracks of civilization that the scientific world heard no details of the event until twenty years later. Then a Russian explorer, L. A. Kulik, who had penetrated to the scene of the fall in the summer of 1927, came home with astounding news.

Over an area some miles in diameter all the trees had disappeared, while the ground was torn and furrowed as though by a gigantic harrow. Here and there were circular cavities, resembling lunar craters, each probably marking the spot where a mass of the meteoric material had buried itself in the earth. Around this central area for a distance of many miles lay millions of trees, stripped of bark and branches, and all with their tops pointing outward. They bore marks of a uniform scorch, quite different from the effects of a forest fire. The sudden compression of the air under

FIELD MUSEUM OF NATURAL HISTORY

LITTLE FELLOW

Digging out the Colby, Wisconsin, meteorite that fell July 4, 1917, in two pieces, the larger piece weighing 150 pounds. Compare its crater to the above

the falling matter must have generated great heat and sent out in all directions a furious hot blast that seared and shattered the trees.

The region is very sparsely inhabited, but Kulik found several natives who had observed this rush of air. One, living forty miles from the place of fall, had been hurled several feet by the blast, which also wrecked his house. Another man had a herd of fifteen hundred reindeer in the forest, and only a few scorched carcasses of these animals could be found after the event. Recent investigations have shown that the shock of the fall was registered by seismographs in Germany and the air waves by barographs as far away as England.

As one part of the globe is as likely to be bombarded by meteorites as another, it was merely a lucky chance in this case that directed the celestial missiles toward a wilderness rather than toward some densely populated region. If the fall had happened six hours later, the earth would have turned far enough so that southern Norway or Sweden would have been the target, and there would have been great loss of life. If it happened farther south, at a different hour, it might have wiped London, Paris or New York off the map.

Something like this recent meteor fall in Siberia must have happened ages ago in the desert of northeastern Arizona, about two miles east of Canyon Diablo. Here may be seen an enormous hole in the ground—a circular depression about four thousand feet in diameter, with walls rising one hundred and fifty feet above the surrounding plain and descending precipitously six hundred feet to the floor. This formation was formerly known as Coon Butte, but is now usually called Meteor Crater. Within five miles of the crater thousands of iron meteorites have been picked up, and the many borings that have been made here, with a view to locating a buried mass of iron or other valuable material, show that the rocks of the crater's bottom have been crushed to a depth of several hundred feet.

The evidence seems conclusive that this hollow was formed by the impact of a giant meteorite, or of several meteorites falling together, and that the event happened not more than two or three thousand years ago, when flourishing cities and centers of civilization already existed elsewhere on the earth. Trees fully seven hundred years old grow on the walls of the crater, but the formation shows slight indications of erosion and must be geologically recent. A few other crater-like valleys, possibly due to meteor falls, are found in other parts of the world.

About half of all the meteorites contained in museum collections were actually seen to fall. The remainder, including most of those of great size, are, with few exceptions, known quite definitely to be meteorites on account of possessing certain features characteristic of such bodies. Some are of stone, others of iron, and still others are about half and half, while about thirty chemical elements, variously combined, have been found in them.

The largest meteorite "in captivity" is the great iron specimen known as the "Cape York meteorite," which Peary brought from the shore of Melville Bay, Greenland, and which is now in the American Museum of Natural History, New York City. It weighs about 36½ tons. A meteorite estimated to weigh not less than fifty tons still lies where it fell near Grootfontein, Southwest Africa, and one believed to weigh between 70 and 80 tons was reported last March to have been found midway between Lakes Tanganyika and Nyasa in eastern Africa.

As to the origin of these celestial visitors, it is probable that some of them come to us from remote depths of space, but others may have always formed part of the solar system. Many great streams of meteors now travel around the sun in elliptical orbits which intersect the orbit of the earth. When the earth and numerous meteors belonging to one of these streams reach the point of intersection at the same time, a "shower" of meteors is seen in our atmosphere. Recurrent showers are expected on certain dates—every year or every few years—and the meteors of a particular shower are named according to the constellation from which they appear to radiate—on account of perspective—as they approach the earth. Thus we have the Leonids, which come in November from the direction of Leo, the Perseids, in August, from Perseus, and so on.

Some of these meteor streams follow the same paths around the sun as do certain comets, of which they probably originally formed a part. The heads of comets themselves are probably nothing more than dense clusters of meteors. The stream of the Andromedes is supposed to have resulted from the breaking up of Biela's comet; the Eta Aquariids are connected with Halley's comet; the Perseids with Tuttle's comet, and several other similar connections are known or suspected.

Most interesting fact of all—the meteoric superthunderbolt that hit Siberia in 1908 was apparently traveling in the orbit of the Pons-Winnecke comet, though the comet itself was then on the opposite side of its orbit. This comet, during its last approach to the earth, in the summer of 1927, was visible to the naked eye, and there was a good deal of talk about the possibility of its colliding with our planet. Perhaps a fragment of it actually *did* collide with the earth on the 30th of June, 1908 and has not been reported.

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These fascinating articles on weather, climate and other phenomena that they suggest have been a frequent and popular feature in Nature Magazine for several years. We would be interested to have any comments on them from our readers or suggestions as to what other stories about related subjects they would like to read.

A BRANCH OF THE YAUPON WITH ITS MANY BERRIES

In the inset we have a close-up of the berries, which are a transparent crimson amid rich green leaves

YAUPON, SHRUB OF HOLIDAY HUES

BY I. THOMPSON SMITHERMAN

With the coming of the holiday season we are again confronted with the inroads made into our native supply of holly and ground pine and other wild greens used for decorative purposes. If these are to prosper they must be gathered with care and regard to the future. The use of substitutes is urged upon flower lovers. Perhaps the propagation of the yaupon, described in this article, offers a solution to the true conservationist.

WITH many of our wild-growing evergreens facing serious depletion and even extermination through the holiday demand for decoration, we must turn to other sources for the reds and greens of Christmas time. So let us consider the Yaupon, that beautiful shrub with its wealth of transparent crimson berries clinging closely to the soft gray-green branches amid a rich green foliage. Here is a gift of Nature that brightens the country roadside or adorns the home grounds as hedge or gate arch, or merely as a lovely shrub.

Known variously as yaupon, yupon, ceassene, cassena, tea plant or Christmas berry, this decorative shrub is a relative of the holly and is known scientifically as *Ilex vomitoria.* It is a southern citizen, essentially, ranging wild in the Gulf Coast states and up the Atlantic Coast states as far as the Carolinas. It has been successfully transplanted as far north as Canada, however.

Yaupon is bi-sexual and both staminate and pistulate trees must be planted to produce fruit. It likes any kind of rich soil or red clay, but does not favor sand. It grows thickly over pasture lands, where planters must constantly cut it back, and along unmolested roadsides. It is often found in many unusual shapes from having been nipped by cattle, and may appear cropped as a trim little Christ-

mas tree some fifteen feet tall, with pointed or rounded top.

Nursery catalogs seem to overlook the yaupon, both, probably, because it is so common in its native haunts and because it is not easy to transplant. It is believed that the seed will not germinate unless it has first passed through the digestive system of bird or chicken. Study of the preferences of the yaupon indicate that the best season for transplanting is just before the sap rises in late winter. A damp day is ideal and a large ball of dirt must be left around the roots, these bound with heavy, damp burlap if the shrub is to be shipped. Transplanted specimens should be trimmed back closely if the shrubs are to succeed and recover from the disturbance of their roots. Once established fine hedges can be developed by trimming.

Age seems only to improve the rich green foliage of the yaupon, and blight and pests pass it by. The berries hang on the entire year and a branch will bear both blossoms and berries at the same time. The thickly-growing shrub is a favorite nesting place for the sweet-voiced mockingbird, and often one will see the lovely wild jasmine entwining to the topmost branches of the yaupon.

The Indians are fond of making tea from the yaupon leaves, and it is said that the foliage has stimulative powers. In the hill section of Louisiana yaupon is called "fitty berry" because the tempting fruit is said to be poisonous to birds and to cause them to fall in a fit after eating it. However, this is not believed a proved fact.

Yaupon does, indeed, offer a solution for the holiday decoration problem. A shrub or two, once strongly established on one's home grounds, will become a perennial source of colorful green and red branches. And those who know the yaupon feel that it certainly may have a claim to the title of America's most beautiful shrub.

So, while the yaupon may serve to relieve the pressure on some of our other Christmas greens, let us remember that laurel, holly and ground pine, our chief sources of decorative material in the East, are not far from extinction in many places. In fact serious inroads have also been made into the native supply of such western greens as toyon and Oregon grape. Protection should also be accorded winterberry, smilax and galax. Only the mistletoe and the Christmas tree, as a matter of fact, do not need protection and careful gathering, although the latter should be intelligently culled as thinning from standing trees.

Manufacturers have successfully developed substitutes in the way of wreaths and other decorative material. Also the prices now charged for many Christmas decorations, while reflecting graphically the growing shortage, likewise open the opportunity for commercial production of various greens. It is to be hoped that before it is too late we can build up a source of supply that will at once satisfy the demand and assure that our wild resources in Christmas greenery are not entirely wiped out. All true lovers of the outdoors should cooperate to bring this about, both by conservation practice and preaching.

FLOWER OF THE HOLLY, RELATIVE OF THE YAUPON

Gathering of holly for Christmas decoration has greatly endangered the native supply of the shrub and substitutes should be used wherever possible

A BOULDER COVERED WITH LICHENS

These are among the first arrivals in the task of fashioning a jungle from nothing

HOW THE JUNGLE IS BORN

BY PAUL GRISWOLD HOWES

PHOTOGRAPHS BY THE AUTHOR

In this article Dr. Howes tells of the making of the great jungles such as the members of the American Nature Association Caribbean party will see on some of their trips ashore. If you are interested in going along, let us know. See announcement elsewhere.

THEN FERNS FOLLOW UPON THE MAKING OF FIRST SOIL

They grow luxuriantly to the size of small trees, die down in the competition and give way to the early saplings of the future forest

A HANDFUL of men had felled an acre of primeval forest. Only a week or two before, these trees had sheltered myriad living creatures, had mothered them fondly in their great humid arms. Then came the men with their axes and cutlasses. They toiled and razed every living thing, and departed leaving terrible havoc where there had been supreme beauty.

A week later these men returned. Under the fierce rays of the tropical sun in the dry season, every living cell of green had vanished. No atom of chlorophyl remained but had turned to the horrid brown of death. Pleased, the men lighted the torch and applied it to the wreck, and thus roasted the bones of the fair forest. They crackled in agony, sending their moans to the far corners of the surrounding jungle, showering the skies with livid sparks and filling the air with the odors of their destruction.

In a few hours the thing was over. The great forest strip had disappeared into the atmosphere, leaving piles of ash where had stood the butts of mighty Gomiers and Chataniers. The fire had done its work in the deadliest manner and after the rains had washed the remains into the earth the place was ready for the garden of man.

Almost as the last wisp of smoke rolled skyward, the question arose in my mind: How did the great forest come into being? This strip had been burned above a foundation of lava and that which goes to make a volcanic island. Originally, whether thrust up from the depths or left dry by receding waters of the sea, it is certain that Dominica was but a mass of inhospitable lava-rock totally unfitted for the support of the most meager forest. How then could it have come about? Why such a magnificent jungle on this isolated dot of land?

The mighty trees succeeded, but how? And the pleasantly cushioned forest floor with all its delicate system of fully nourished things, how became it a successful whole? What has clothed the lava skeleton with such abundant beauty?

LARGER MOSSES AND LICHENS FLOURISH ON THE ROCKS

They follow upon the first and smaller ones, gradually giving way to ferns and flowers and meanwhile furnishing the basic soil

Let us remember always, that there is one tiny form of life that we cannot exclude. It creeps in from nowhere in particular, and is endowed with the ability to live and thrive on almost any barren thing. Its seeds or spores, or whatever you choose to call them, are everywhere in the atmosphere. They are so minute as to be invisible to the naked eye, but everywhere that air exists, so do these seeds that lay the foundations of our forests. By any ordinary means it is impossible to exclude those universal plants called moulds.

Take as an experiment a tiny bottle. Fill it with gelatine and let it harden. In a few days, with no care whatever, tiny colonies of mould spring into being. Not one, but a dozen varieties there may be. They grow and grow, and flourish over night into luxuriant fields of microweeds. Who planted these seeds? Where did they come

from? Take a bit of bread and place it under a jar and keep it damp. Watch your shoes in a moist climate; look at the top of your uncovered jars of jelly. What is the result? Moulds.

And so these invisible things traveled on the winds from the older continent to the murky shores of the newborn island. Then some tiny thing, a bit of a sea creature, a dead animal perhaps, became stranded on the new shore. Dissolved by the rains and sun, it created upon these hopeless rocks the wherewithal to support those pioneers of the coming jungle, the moulds.

Likewise there came by the agency of wind the spores of other things. There were spores of certain fungi ever searching for their partners, which they found. In the symbiotic unions that were formed, the lichens were born. Once established they spread rapidly, for lichens thrive upon meals of rock. They left the shorelines, mounted the hills and scrambled up the highest mountains.

Lichens possess tiny roots. They are capable of entering the most minute cracks and clefts in stones, ones that we cannot even see. We all know how a soft-bodied tree may split a large rock in half, once the seedling lodged in an earth-filled crack begins to grow. The tree is not crushed. The rock splits instead. So it is with the lichen on a smaller scale. It sends its rootlets into the crevice. The rootlets grow and a tiny rock fragment falls away.

Torrential rains and the acid they carry from the sky dissolved some of this mineral matter, while the death of millions of lichens, as generation followed generation, supplied organic elements. All this material blended together brought to the land its first soil, poor and thin, but able to support the first plants of a higher order.

Mosses came first, adding their bit and enriching the mixture ever so little. Ferns followed, flourishing in the graves of the mosses and lichens and themselves dying to make a better world for their much larger offspring.

Still higher plants came upon the scene, brought by currents of the sea or dropped by the first birds to arrive from the mainland; and, later, blossoms were born.

Now competition arose. A constant striving toward the sunlight. As time went on this produced plants with longer stems, since those with the tallest ones would naturally be most successful. Year by year the vegetation lengthened out and thus were trees evolved. Their children inherited the height of their parents. Saplings grew into greater things and these in turn into the mighty giants of the forest.

AND FINALLY THE JUNGLE TREES
They are the eventual achievement of the first spores and moulds that built the forest

Islands of green living things grew broader and joined with other islands, and so at length the barren rock disappeared beneath the soil and vegetation. As years drifted into ages and the soil became deeper and richer, the giants of the jungle sank their roots into it and bracing themselves amongst the rocks below, laced the whole together to hold in the water of life and to add strength to their own huge bodies.

The day of many birds and mammals and insects followed. At length there were the Dominican forests of today, forests that clothe every foot of hill and mountain with richness and ever hold a high emerald canopy above the explorer of her secrets. When I wander through this paradise, it seems greater to me than any cathedral ever built. It is a worthy place to worship, this cool, dim forest, filled with the songs of mountain birds. There is ever mystery born of its very luxuriance, which hides so much but tells so much to him with the inquiring mind and the will to explore. That is what we call the lure of the jungle.

Think what the acre of jungle meant. This one that went to its death by fire. What a struggle through all those countless years since the wind-borne spores of moulds laid the foundation of its life. Think also of man, the supreme achievement of evolution, who comes with his little axe and his torch and the awful power to undo this vast work of Nature in but a single day! And how thoughtlessly, ruthlessly he does it!

CARING FOR POTTED PLANTS

BY MARY LOUISA HELLINGS

How many times do we hear the housewife remark that she never has any luck with plants in the house? Many times, certainly, so here is an article based on experiment and experience that should help her to success.

ILLUSTRATIONS FROM J. HORACE MCFARLAND

OF COURSE the natural place for plants to grow is in the ground, where the roots can spread and get plenty of nourishment, and the whole plant can get the benefit from rain, air and sunlight. But when it comes to confining their roots in the small area of a pot, special care is needed to produce a luxuriant, healthy growth of foliage and flowers. In the average home potted plants are placed about for decoration, and too often little thought is given to the things they need that they may live a happy life.

Soil, potting and watering are the three fundamental factors of plant culture. Since every plant has its own particular likes and dislikes as to soil, a general suggestion only is possible. Soil for potted plants should consist of three chief elements—a fibrous loam, plant food and sand. These elements cover a wide range of foundation soils. However, I find soil from the woods is sufficient in humus to make an ideal fibrous loam, so to every five pounds of it I add two wooden spoonfuls of wood-ashes, one of lime, and one of plant food. The proportion of sand depends upon what I am going to plant. All fresh-dug soil should be carefully sifted of foreign matters, specially worms and insect eggs, and stored in dry condition. Before using, soak it with boiling water and let the soil dry out sufficiently to work up nicely for the mixture of the other elements that are necessary.

The best kind of soil for each individual plant is an important study by itself. A rose, for instance, needs an entirely different soil from a cactus, the former preferring some clay substance in a loam with well-rotted cow manure; the latter needing three times as much sand as a fibrous loam with the presence of lime and never manure. Chrysanthemums, asters and such flowering plants require rich non-acid soils of various kinds, careful watering and expert care for superior results. Perhaps it would be safe to say that as a general rule soft, non-wooded growing plants, like ferns, vines and such, require a rich, moist soil, while bulbous and fleshy plants need equal parts of sand with a fibrous loam, and less water. Alpine flowers such as the dianthus respond best in a rich soil where some sort of fine shell has been added in place of sand. Other kinds of alpines prefer limestone chips. All ericaceous plants and azaleas react against lime and non-acid minerals in the soil, needing plenty of oak leaf mold and such acid-forming humus as peat moss, and so on. Study your natural soils.

It is necessary to wash all pots, new or old ones, and let soak a while before using. Place a piece of crock in the bottom of the pot to cover the hole, then add a few more smaller pieces about it, placing a bit of leaf mold or dead fibrous roots over them before adding the soil.

If the plant is a cutting having been taken direct from the sand, sift a little clean, sharp sand on the soil before placing the roots, and also dust a bit over the roots before filling the pot up with soil. Leave a half-inch space at the top to allow for enriching, cultivating and watering the plant. A thin layer of leaf mold or any good humus spread on the top prevents washing out of soil and the forming of a hard crust from drying out.

The majority of ornamental plants require repotting in the spring. This is necessary so they may make new growth in the season of the year intended by Nature. When weather becomes favorable they will grow better out of doors, placing them in a place sheltered from the wind and showers, where they can get a moderate amount of sunlight, fresh air and dew. Always water them, if possible, with rain water, keeping the soil cultivated and the foliage clean and free from insects and disease. Some potted plants are benefited by planting in the ground for the summer and repotting again in the fall. This method is not advised where one does not understand the culture of plants. One has to be careful when repotting such plants to see that angle worms, and the like, are not left about the roots, because they accumulate at the bottom of the pot checking the proper drainage and causing other misfortunes. So the only safe way when lifting small, young plants is to wash the roots before repotting in the specially prepared soil. Plants that dislike having their roots disturbed can be planted in the ground in manure pots. Thus the potted ball is held together and does not prevent the plant from rooting out during the season. It is, besides, somewhat safeguarded against worms and less likely of having the main clump of roots disturbed whenever one desires to repot it.

PRIMULA MAKES A SPECTACULAR POTTED PLANT
It is not difficult to care for indoors if the general rules for attention are followed

Flowering plants need to be repotted more often than ornamental plants. When the pot becomes such a network of roots that the top soil cannot be cultivated, the plant is then pot bound and needs to be transplanted to a larger pot, but one not more than two inches larger, especially if the plant is to flower in a short time. If too much new space

AND CONSIDER THE LILIES
In many varieties they offer opportunity for care and development in the house

is given the roots the plants will start new growth of foliage instead of budding up. Run a sharp knife around the inner edge of the pot, invert it and hold the base of the plant between the fingers and gently tap the pot. The whole matted root growth is then placed undisturbed in the larger pot, with new soil firmly placed in the added space.

When it comes to watering plants, do it thoroughly but only when needed. It is best in the morning during the winter, and at evening the remaining seasons of the year. Large potted plants cannot be successfully watered from the top. The whole pot should be placed in warm water for about a half hour once a week, and the foliage washed to keep it clean and free from any insects, lice, or other pests and diseases that infest neglected plants. Small pots are best placed in water which comes well up the sides but not over the edge. When the top soil looks moist, the lower portion of the pot has absorbed sufficient water. It is a better plan to water thus thoroughly once a week than to rely on the general "pouring on" method to reach the lower portion of the pot. In every way I can I follow the ways of Nature in caring for potted plants, always watering when possible with lukewarm rain water. Snow water is just as good to use in the winter when one cannot get rain water. Plants respond so much better to this treatment than from the sole use of water supplied for household uses. Everyone has observed how everything is refreshed and responds to growth after a shower. Just so do potted plants respond to rain water baths from the sprinkling can, followed by a sun bath. Watering should not be done at regular intervals, but, rather, when the plants require it.

OR SOME LILY OF THE VALLEY

Hardy out of doors, they can be just as lovely and fragrant within if care is taken to reproduce the conditions they enjoy outside

Strive always to make conditions as natural as possible. In the house this is hard to do because the atmosphere must necessarily be dry, and sunlight comes in the window in a one-sided way, unless it is a bay window or conservatory. In the ordinary window plants grow towards the light. To equalize things the plant should be turned at frequent intervals to keep its shape and receive proper light on all sides. Some plants prefer a diffused light and thus can be placed about the house as decorations. But sun-loving plants should get a southern exposure of direct sun rays.

CHRYSANTHEMUMS DO WELL

They require rich, non-acid soils together with careful watering and good care for the best results

Since the dry, warm air is unnatural, the rooms in which the plants are placed should be given fresh air ventilation at least once a day. The foliage would absorb quantities of moist air every day if they were out of doors. In the house the plant must get all its moisture from the soil, so it is necessary to provide air and water intelligently.

Large, vigorous, succulent-growing plants require more water than small, woody, slow-growing sorts. When washing the foliage never use petroleum oils or laundry soaps. If you have any sort of lice, scale or fly infection to combat wash the leaves and stems well with soapy whale oil water with a bit of nicotine added. Hold the pot under the arm when washing the foliage, or arrange it in any convenient manner so the soapy water does not run down into the soil. Sprinkle well with clean water afterwards so no film of soap remains on the foliage.

The lower leaves of plants often turn yellow, and for various reasons. It may be an old plant wanting a rest. Every plant has its periods of rest. Winter naturally is the season, so to offset this young plants should be potted for winter decoration. Then, too, the plant may be pot-bound. Also the soil may have been kept too wet, or it may lack in organic matter. Ferns, palms, umbrella and rubber plants are tolerant to year around growing conditions, but flowering plants need several changes a year to keep them growing. Unlike the ornamental plants, the flowering plants bloom more profusely if not given too much root-growing space. Thus we see a beautiful flowering plant in a much smaller pot than an ornamental plant of the same size. It takes more root growth to produce foliage than it does flowers, so provide ample pot-room.

When evergreen trees used as ornamental plants indoors begin to lose the richness of their color they can be restored by adding a spoonful or two of mineral oil to the soil, watering well, and giving as much sunlight as possible for a while. The presence of iron dust or such particles in the soil has a tendency to keep some kinds of plants unusually luxuriant. A change in plant food sometimes is helpful, though I find the kind I use wholly sufficient for the needs of beautiful flowers and wonderful foliage. Plant food should be carefully used about every six weeks, and the top soil cultivated at frequent intervals. Sometimes I water with liquid manure and at other times with a bit of lime added to the water given the plants which like such things. I am careful to keep the pots clean on the outside, since it aids the growing of healthy plants. Never let water remain in the saucers, because waterlogged plants cannot be strong and of good color.

Potted plants are a wonderful source of pleasure to care for and to watch grow. They breathe; they feel the changes of heat and cold; they eat and rest. Think of all these things when you care for your plants, and they will respond to your attention. Love your plants and they will live for you. Once you learn their needs and how to care for them, and you like them, they will respond just like other things that know you care for them. So if you possess a patient, thoughtful nature, and a heart that feels the spirit of life—in all its quiet, wonderful ways, you have success and the pleasure it gives right at hand.

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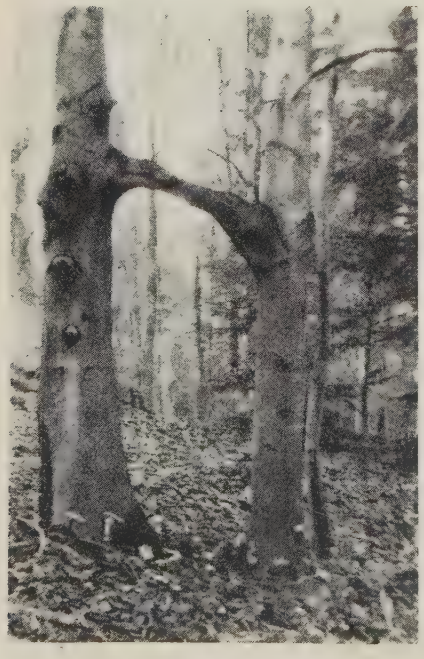
TREES THAT REFUSE TO BE ORDINARY

BY A. G. BUERGE

PHOTOGRAPHS BY AUTHOR



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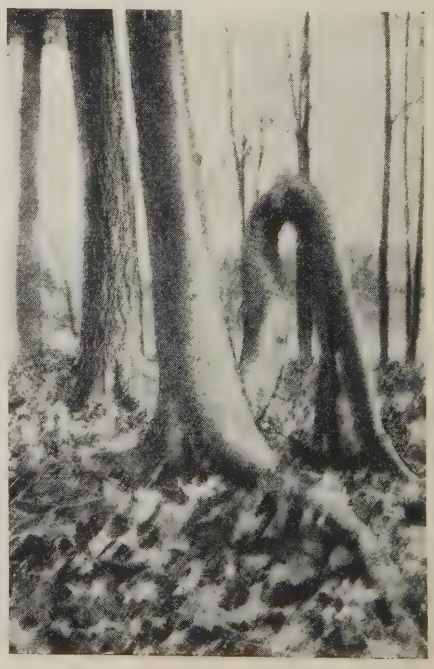
THERE is nothing of the conformist in these trees. They seem to be able to do things ordinary, every-day forest-growers would never think of. The two that appear to be shaking hands are bound as closely as the Siamese twins by a common branch. What evidently happened is that two limbs started out directly toward each other when the trees were small, met, and formed a natural graft. The birch root at the right is performing its graceful convolutions because it originally had to grow over a stump. The stump, however, rotted and left the arch.



FRANKLIN'S GROUSE

This is the western counterpart of the eastern Spruce partridge and is of similar habits and plumage. The high country from Montana, Idaho, Oregon and central British Columbia to southern Alaska affords a home for these birds whose tameness has ofttimes led to their undoing. They have been known to stand and watch the approach of a hunter, making no effort to escape. However, some have learned discretion and become shy. Small groups perch together in the trees and, if absolutely quiet, blend with their surroundings so that they are quite invisible. In the mating season the male shows off by fluttering upward along the trunk of a leaning tree. The grass-lined nests of leaves and twigs are placed on the ground in wooded mountainous areas. Their eggs number from eight to eighteen and are brownish with spots of darker brown. They are non-migratory and their winter food consists of leaves and buds of larch, spruce and other coniferous trees, while in summer they live on the berries of numerous woods plants and some insects. They are quiet birds, and this may save them from early extinction.

FRANKLIN'S GROUSE—*Canachites franklini*

RUFFED GROUSE—*Bonasa umbellus*

RUFFED GROUSE

This hardy dweller of northern woodlands is growing rarer as its native haunts are being cleared of their protective cover to make way for farms or to serve as lumber, and since the hunters have so increased. The bird is non-migratory, hence it does not re-establish itself in localities where it has been extirpated. The habit of the male of perching upon a log or rock and making a rolling, drum-like sound with its wings is one never to be forgotten when once observed. Its nest is placed in a depression near a rock or fallen tree. There are eight to fourteen pinkish, buffy eggs marked with brown. The young are characteristic fluffy infants, quite able to leave the nest as soon as the first downy coat is dry. It is nearly impossible to see them when quiet, they are so much like their surroundings. Their food consists of insects, seeds, nuts, leaves, buds and berries. They live in the forests of Canada, and our northeastern states, west to the Great Plains, in our Rocky Mountain states south to Utah, and over most of Washington and Oregon. On a few occasions they have been raised in captivity.

BAND-TAILED PIGEON

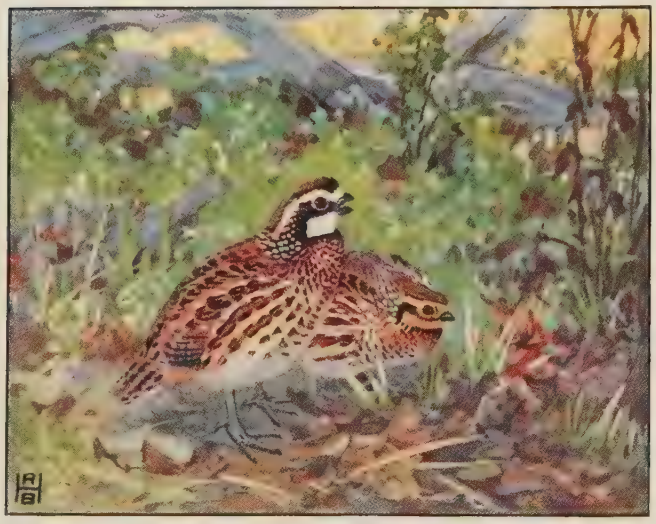
The Band-tailed pigeon is native in the Pacific Northwest east to Colorado and New Mexico; south through Mexico to Nicaragua; wintering in the southwestern United States and southward. Though never so numerous as the Passenger pigeon which formerly clouded the skies of the east, these birds of the west also gather in flocks. They have been used so freely for food that they, like the eastern species, might have been exterminated but for timely protection. In common with others of their kind, they are vegetarians and their favorite feasting place is beneath an oak tree which has dropped a plentiful crop of acorns. Their one or two white eggs are laid either on a frail platform of twigs on a branch, or in the deserted nest of another bird. Besides acorns they are fond of fruit in season, including salmon, elder and manzanita berries, together with uncovered grain. In an Oregon midsummer these birds often collect in small flocks. They fly out over the meadows and dip and turn, showing to excellent advantage the square tail with its broad, light band which gives the bird its name.

BAND-TAILED PIGEON—*Columba fasciata*

MOUNTAIN QUAIL

This exquisitely marked quail is a native of the Pacific coastal region, living in the mountain valleys and upper hills of Washington, Oregon, California and Lower California. In southern Oregon they are to be seen among thickets of Kunzia and other chaparral, feeding on berries, seeds, leaves and buds of these plants and on ground-inhabiting insects, including beetles and ants. They choose the protection of a thick shrub, old log, or the lee of a rock for their nest site. A slight hollow in the ground with a few leaves serves as a nest. From eight to a dozen eggs of clear, creamy buff are laid during April or May. The young are precocious mites and, after a brief period of brooding by the old bird, their coats are dry and away they all go food hunting. The color and striping make the babies entirely invisible when they remain quiet in the presence of some intruder. These youngsters are only a few days old when the two plume feathers begin to grow. These are what give the common name of plumed partridge to this bird. They are quite garrulous, given to much small talk and whistling while seeking their food.

Mountain Quail—*Oreortyx picta*



Bob-white—*Colinus virginianus*

BOB-WHITE

Perhaps no bird call has been more widely used as a signal than that of our American quail, the Bob-White. Its clear, sharp, musical note has a carrying quality possessed by few, and the simplicity of its call lends itself to ready imitation. This is the only quail in eastern United States, and is a much loved bird wherever known. In the north it is called quail; in the south, partridge, but he calls himself Bob-White, and so he is known by bird people all over the country. He remains the year round in his chosen home, a useful friend to the farmer, because he eats harmful insects and weed seeds. The male usually incubates the first ten to eighteen pure white eggs and has been known to bring off a brood successfully, unaided. When undisturbed, the flock hunt together, picking up titbits as they walk sedately along or run short distances to capture a particularly luscious bug or beetle. If alarmed they scatter and "freeze" until called together by the plaintive "quick" call of the leaders. At night they sleep in a group, tails in, giving each an even chance to make an unimpeded, explosive exit.

CALIFORNIA QUAIL

This quail has been very abundant throughout its range in the valleys and foothills of the Pacific Coast from Oregon to Lower California and has been successfully introduced into some other states with suitable habitats. Usefulness is added to beauty and attractiveness by the fact that their food is largely weed seeds and insects, most of which are a menace to the agriculturist. Their dozen to sixteen irregularly spotted, buffy white eggs are placed in a grass-lined hollow beside a fallen log, brush heap, or sheltering rocks. The young are dainty fluffy mites, quite able to care for themselves soon after hatching. It is a delight to accept their invitation to "Stay right here, sit right down," when one enters a semi-shaded patch with moss-covered logs for seats. If you do stop you may see the covey come sedately along with nodding plumes. One may also see them feeding among the alfilaria in an orchard which borders the uncut edges of a river bank. They will pay little attention to you if you make no sudden movement, but wander about, talking softly to one another, while you admire their beauty and dainty ways.

California Quail—*Lophortyx californica*

WHITE-TAILED PTARMIGAN—*Lagopus leucurus*

WHITE-TAILED PTARMIGAN

What could be more nearly invisible on a snow-covered landscape than a pure white bird? Ptarmigan puts on a white garb for the winter months, together with feathers on his toes to act as snowshoes. In the summer the plumage is mottled with colors which blend with the treeless home of this bird of the mountain tops. In this unpromising land they really find a good living, for there are not so many other kinds of creatures with whom they must share the small supply of beetles, caterpillars and other insects and the tender leaves, buds and fruits of alpine plants. Their nesting sites are varied, but the nest is placed in a grassy depression with the stems sometimes woven together and feathers added. The ten to sixteen eggs are buffy with heavy spotting of dark brown. Incubation is the job of the female, who is not easily frightened from the nest; however if forced to leave she tries to distract attention by simulating injury. The downy young are in shades of yellow and brown, and become experts on the wing at an early age. They often cover their tracks by dropping into a snow bank for the night.

THE PRAIRIE CHICKEN

This bird was formerly abundant in prairie regions from Southern Canada through the United States to Louisiana and Texas. When their territory became settled they were useful both as food and for the help they gave in the destruction of insect pests. But, as so often happens, man overstepped the bounds of moderation, and today these birds are gone except in a few states where protective measures have saved small numbers. The males in spring have the interesting habit of strutting with a display of orange-like pouches and fluffed, upraised feathers, while they dance, each on his chosen spot. In some open place the nest is built in a slight hollow, sparingly lined with grass and feathers. Here about a dozen buffy, dark speckled eggs are laid. Like all young of this type of bird, the downy babies leave the nest as soon as they are dry. The mother attends them and before long they are able to pick up their own living of small seeds, insects and buds and leaves of green plants. The birds are especially useful in the destruction of grasshoppers, which often play havoc with crops.

PRAIRIE CHICKEN—*Tympanuchus americanus*

SCALED QUAIL—*Callipepla squamata*

SCALED QUAIL

These birds are native to the southern arid part of the Great Plains region of the United States and extend southward into the valley of Mexico. They are essentially desert birds and feed upon the characteristic dry vegetation. They run in flocks and wherever water holes are to be found there they congregate in large numbers. Their pale color affords them excellent protection in the dry, barren country which gives them but a scanty cover of chaparral. Under the shelter of some low bush, cactus, or yucca they scoop out a nest in the sandy ground. There are nine to sixteen eggs, buff, spotted with red-brown. The male helps in the care of the young, and two or three broods are raised each year. They are fleet-footed birds and can capture the swiftest grasshoppers as well as many other insects of the desert. About half their food is weed seeds. The Chestnut-bellied scaled quail is similar in habits and appearance, differing only in the belly patch. Like all the birds of this group this species has become much reduced by hunting. By all means this charming bird should be most carefully protected.

SHARP-TAILED GROUSE—*Pedioecetes phasianellus columbianus*

SOOTY GROUSE

The Oregon hooter, one of the largest of its family, inhabits wooded areas on the Coast range from Alaska through California. It perches and feeds well up in fir, pine and other conifers. The booming call of the male, produced by filling its air sacs and forcibly expelling the air, has a quality which makes the bird difficult to find. If discovered it may sneak around the tree and disappear in the dense growth. May and June are months of mating, and soon the female is snuggled over her seven to ten brown-spotted, cream-colored eggs. Hers is the entire task of incubation, and she seldom needs to leave her treasures for long, as the scantily lined nest is placed in a protected ground hollow surrounded by a generous food supply of berries, insects and buds. In three weeks the mottled, fluffy babies are out and follow her about. Now the father appears to help in their training and to stand guard when danger threatens. Soon they are able to hop to branches to perch at night. Their winter food is the needles and buds of fir and pine, and often their bed is a snowdrift. There are other related forms.

SAGE HEN—*Centrocercus urophasianus*

SHARP-TAILED GROUSE

The sharp-tailed grouse is an inhabitant of the rougher plains country of western North America from Alaska to northeastern California and eastward to Hudson Bay and Illinois. It is strong in flight and is better able than some of its relatives to escape the hunter. From the more northern parts of its range it must absent itself during the more severe months. Its habitat occurs mainly in remote and unsettled country, and probably for this reason few intimate studies of its life history have been made. Careful observations have disclosed the fact that the pouch displayed during the spring dance is purple in color, instead of yellow or orange, as is usual in its relatives. Its antics are also characteristic, including stiff-legged runs and awkward poses held for some time. The nest is in a hollow in the ground, lined with feathers and dried grasses. The eggs, a dozen or more, are buffy, sparingly marked with red-brown. In winter the thick feathers on legs and feet give the birds snowshoes which assist them in making their way about. They subsist on buds of trees when the ground is covered with snow.

SOOTY GROUSE—*Dendragapus obscurus fuliginosus*

SAGE HEN

As the Prairie Chicken inhabited the prairie region of North America, so the Sage Hen uses the sage-covered plains area from southern Saskatchewan to northwestern Nebraska and west to British Columbia and California. This is the largest of our grouse group. The old birds feed so largely on sage leaves that they become too strongly flavored for palatability. In spring the males dance during the dawn and evening, strutting and displaying their pouches and spread plumage, the tail erect with its sharp-pointed feathers showing above the head like the crown of some ancient monarch. The strut consists of a stiff-legged short run, a sudden stop and toss of the air-filled pouch, which falls back upon the extended chest. This movement slaps the two bare throat patches together with a rubbery "plop." The nest, in the shelter of a sage bush, has little lining, and the seven to nine eggs are olive-brown with round markings of darker brown. The young are able to leave the nest in a quarter of an hour after hatching, and soon begin to feed upon beetles, ants, hornets, grasshoppers and other insects.

A WINTER SCENE
Gnats, closely related to mosquitoes, dancing on the wing in the sunshine of a December day

WINTER WITH THE INSECTS

WHERE THESE AND OTHER ARTHROPODS GO WHEN THE MERCURY FALLS

BY S. F. AARON

ILLUSTRATED BY THE AUTHOR

BY NOW, in northern climes, the methodical home owner has slipped his window screens from their runways and stowed them carefully away. He does not reason why but merely knows that house-fly and mosquito have gone, and, more than likely, he makes the subconscious observation that all the insects are dead for this year. That cold snap, he reasons, has killed them off. But he is only partly right.

In the insect world the adult life of most species is only a few weeks, and some succumb to low temperatures in immature stages, because thus Nature checks undue growth in numbers. But in that group of animals known as arthropods low temperatures have little effect upon development except to check rapidity of growth. How, otherwise, could they exist from season to season were not egg, larva, pupa and even adults, in many cases, immune to severe cold?

All species of arthropods of temperate climes hibernate in some form, a vast majority in the pupal stages, very many as larvae, some few in the egg and about as many as the latter in the adult stage, depending on the time and number of the broods. Most species of insects develop so that the eggs are laid in time for the larvae to grow to the pupal stages before the autumn chill sets in; they remain in much the same condition until the spring, for, as with the adults, vitality is suspended by temperatures approaching the freezing point.

Where individuals have performed their normal functions, or, in plainer words, after they have laid their eggs or have given viviparous birth to their offspring, they are ready to die and soon do; extreme cold may hasten their demise to some extent. The cold renders inactive many species and vast numbers make no effort to seek shelter. These may quickly fall victims to birds and little beasts.

Thus many birds, shrews, mice, squirrels, weasels, minks, skunks, opossums, raccoons, badgers, foxes, coyotes, and even bobcats and other animals not confined to

THE MALE KATYDID
It was uncovered in the spring within a mass of beech leaves, its winter dwelling. Natural size

●●●

COMMON FIELD MOTH
The Drasteria, which hibernates in dense vegetation and takes wing on warmer days. Slightly more than natural size

a vegetable fare become happy, no doubt, over easy picking with the advent of the cold season.

With the social ants that do not congregate closely or in tight nesting places there is only a small percentage that do not live through freezing weather. The same may be said for certain burrowing bees. Except the aquatic species that escape the cold in the waters of springs and deep creek pools not one arthropod within my knowledge, not even the digger wasps and bees and the earth- and wood-burrowing and boring larvae of many forms, gains retirement beyond the reach of frost. And whether still in the larval or pupal stages, or having become adults ready for emergence just as the cold increases, they are not killed by lower temperatures, however extreme.

THE COLONY COCOONS OF A TINY WASP
These larvae of the parasitic Microgaster have developed within the body of a sphinx moth caterpillar. The pupal cases are not unlike those of the commercial silk moth, but very much smaller

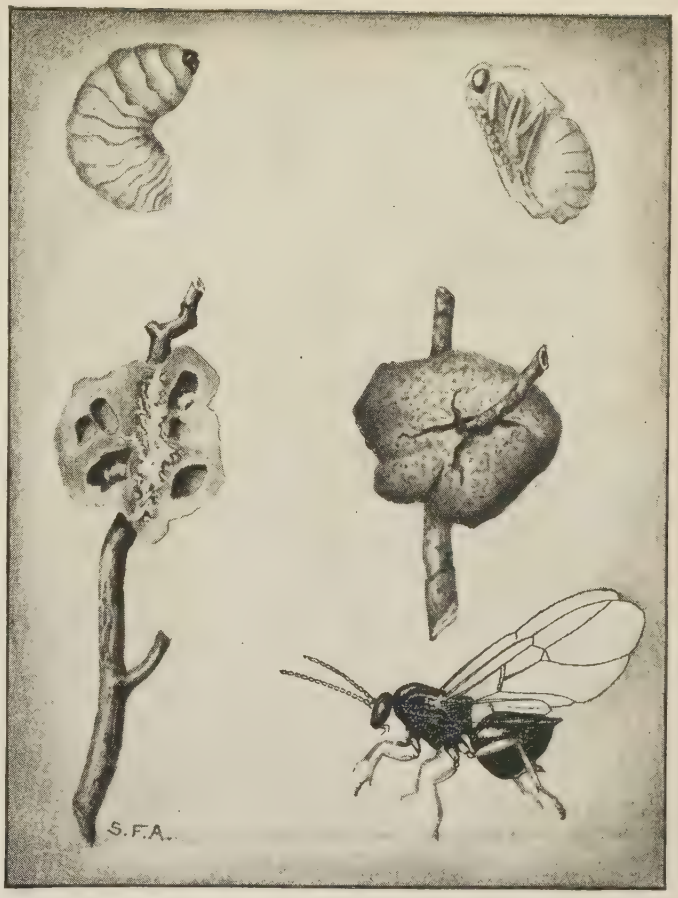
It is supposed by many that larval and pupal encasements—generally referred to as cocoons—are a means of protection against cold. But it is my belief that all larval and pupal domiciles, whether made by the dwellers therein, fabricated for them by parental industry, or the result of growths about them, in short, all cocoons, plugged borings, larval cases, mud cells and galls are solely a protection against enemies—the stout bills of birds, the gnawing teeth of mice and, principally, the sharp ovipositors of the parasitic Hymenoptera. Indication of this occurs in tropical countries where the powerful bills of many birds are to be considered; the cocoons of moths allied to our silk-spinning kinds are far thicker and tougher than any found in temperate climes. Moreover, many species that are protected by deterrent odors spin cocoons so thin that the chrysalides may be seen within them; yet they are immune to cold, as are the chrysalides of butterflies.

It is also worthy of note that there

cannot be sufficient heat generated in the body of any arthropod to overcome a temperature below the freezing point, no matter how well the creature may be encased or hidden away.

To substantiate these statements, which may be somewhat surprising to many Nature students, it is only necessary to go afield with axe and rake and sharp eyes on a mild, sunshiny day following an extreme cold spell. Swarms of gnats are seen dancing on wing in the sun's rays; wasps and hornets which had deserted their fragile nests, built only for rearing their young, and sought shelter under loosened bark and hollow limbs for the winter, have quickly recovered and go on their usual business of making new nests and founding colonies. One can see them winging their way through woods and along fence rows.

Several species of butterflies, commonest among them the *Vanessa antiopa,* the angle-wings, *Grapta* and *Pyrameis,* an occasional white cabbage pest and the black-bordered sulphur, *Eurymus,* skim lazily over the fast-disappearing snow, even now and then settling upon it. Carabid beetles crawl slowly from beneath logs and dry leaf masses, or from under patches of snow held up by vines. A few honey bee workers are quickly taking up their duties, finding sweet tree saps through holes in the trees. A stray water-fly, *Perla,* and a small ichneumon also have taken wing, the former coming from the near-by ice-coated stream, the latter probably from some weed hollow or dense grass shelter. On the bark of large tree trunks parasitic flies, *Tachina,* have emerged from crannies overlooked by the nuthatch, the brown creeper and downy; trusting now not to their swift wings, they crawl to the sunny side and there bask, easy prey to the birds. Black carpenter ants, a little slower



THE OAK KNOT GALL FLY

Its larva and pupa are seen at the top. One swelling is cut open to show the numerous cells. It can hardly be imagined that these tiny insects can withstand the cold, but they do

THE UNDERBARK GRUB

It is the larvae of a beetle, and its only shelter is the thin layer of bark, here partly removed. Natural size

AND THE SPIDER

The adult, the egg sacs and the hatching young are all exposed to the cold. All the individuals are alive but lethargic

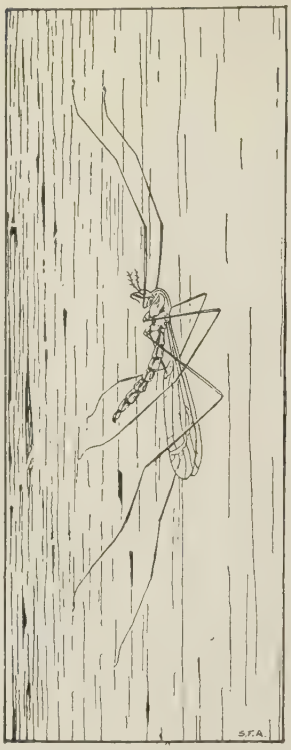
to respond to the change in the weather, poke their heads and questioning antennae from their enlarged beetle-bored nests, some perhaps venturing out to inquire as to the advisability of going forth in search of provender.

Upon stripping away the partly loosened bark from an old stump we may expose the inhabited burrows of the black powderpost beetles, *Tribolium* and *Lyctus,* with both the adults and larvae beginning to move about. Nearby in a mass of chewings and woody offal a number of the big, shining, black cornutus beetles, *Passalus,* or those of the brown stag, *Lucanus,* all make dull efforts to renew their seemingly aimless lives.

By chipping off the more tightly adhering bark from dead and still sappy trees where more sustenance can be gained one may find in shallow pockets and generally within a quarter-inch of the surface those long, flat, grotesque grubs that are the larvae of the underbark beetles, *Dendroides.* Equally exposed in similar places are the adults and larvae of the tiny engraver beetles, *Scolytus,* under the thin bark of cherry, birch, and apple trees.

The raking away of masses of leaves, dead and tangled weed and grass stems and the slowly decomposing silt and debris therefrom discloses sow-bugs, *Oniscus,* true centipedes, *Scolopendra,* curled up or slowly unfolding "thousand-leggers" or Isopods, *Spirobolus,* and several variously formed spiders of which the large black or the small gray jumpers are generally the most common and seem as active as in summer. All of these have even more quickly felt the genial warmth than those creatures of the higher orders, or mayhap have not completely yielded to the cold. The turning over of large, flat stones, big pieces of long-fallen bark or heavy tree limbs will yield similar species, with now and then some added representatives of the true insects in the shape of beetles or bugs of carnivorous inclinations.

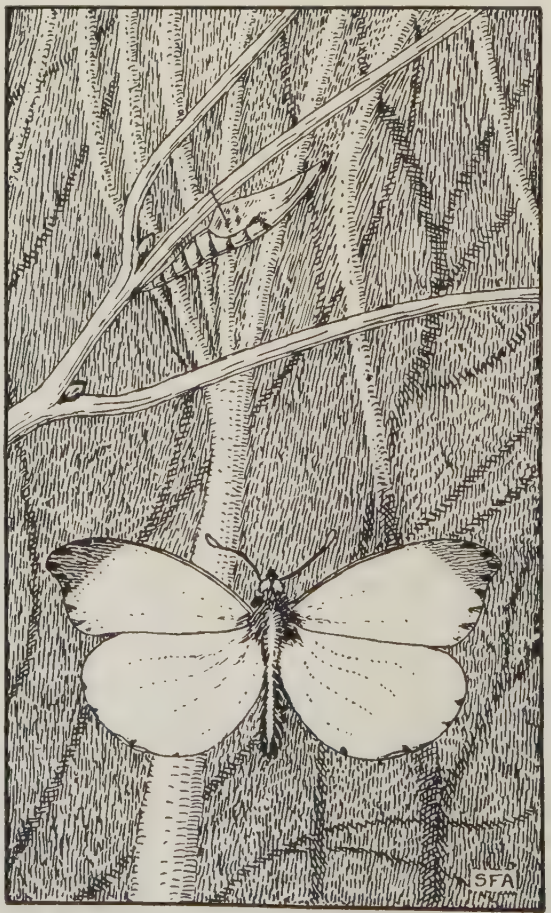
But there is a very evident difference with regard to the effect of cold on these widely varied forms, as a little experiment will demonstrate. Those insects of the higher orders, as indicated by their complete metamorphoses, quickly surrender to a temperature of forty degrees Fahrenheit and not less than fifty or fifty-five degrees calls forth an active response. Grasshoppers, roaches, true clear-winged bugs, *Homoptera,* bark flies, *Corodentia,* spring-tails and *Ephemera* require several degrees less to put them down and out. The centipedes, delving very deep into the mould, may not give up at all and the spiders rarely have their entire vitality suspended.



THE CRANE FLY

Hibernating in an old plugged pump log, and showing insect immunity to the winter cold

In places where the increasing cold has free access, but where the birds, shrews and mice have not, as in a high corner of the farm shop, the barn granary or the house attic window, there may be found tangled webs of the common household spider, *Theridion,* and within these not only the egg sacs but also the web builder herself, often together with her indolent husband, hanging, like her, with drawn-up legs, and a swarm of the just hatched and emerging little ones. But no matter if the temperature is low, and I have experimented thus at ten degrees above zero, if the spiders are slightly disturbed they immediately begin to unfold, and one long foreleg is often extended as though in protest toward the offender. Apparently all species of the true Araneae that may be found in winter shelters of one kind or another, with or without webs or nests, are almost or quite impervious to frost, light or heavy.



THE EASTERN ORANGE-TIP BUTTERFLY

The male and its slender chrysalis. Sometimes this insect emerges ahead of time and may be seen flying on warmer winter days

The theory has been advanced that the vital juices of the arthropods are non-freezing, but this cannot be, for the appendages of an insect, centipede, crayfish or spider, that has been subjected to extreme cold will snap off like those of long-dried specimens, or they will quickly return to normal pliability and activity when exposed to heat. The explanation must simply be that which also applies to the cold-blooded vertebrates; low temperatures do not des-

troy the life in the protoplasmic cells, but merely suspend its vital energy. It is evident that the vitality of the higher invertebrates is destroyed only by a considerable dry heat and seldom by any lack of it.

The clearest and most satisfying evidence of the effects of cold on certain arthropods is gained by subjecting specimens to direct tests. Such tests may be here briefly detailed by quoting from my notebook, over a period of several years, indicating also the inspiration that led to the experiments.

January 21. Found a perla, *Taeniopteryx fasciata,* crawling over snow near a stream.

January 26. Found under sheets of fallen bark, during a thaw, active specimens of wood louse, centipedes and black Harpalus beetles. These beetles also under dry masses of leaves.

January 3. Saw male of orange-tipped *Anthocharis genutia* flying through woods. Day very mild for the season. This insect normally emerging in early spring must have developed ahead of its time. Where shall it go and how survive until spring?

February 2. Mild. Sun bright. Good many insects out with the proverbial woodchuck and as good judges of the weather as he. Many wasps and honey bees, one bumble, one *Vespa maculata.* Many gnats and midges in swarms. Water striders on pools of spring run. Many *V. antiopa* and one *Grapta* on wing in woods.

February 7. Very mild, following snow storm and cold spell. Wading through snow and high grass to scatter grain for bobwhites, I saw gray moth fly out and disappear into another clump. This is *Drasteria erechtea.* Wasps a-wing; also a few bees.

March 1. Warm day. Little sun. Swarms of flying insects, gnats and male mosquitoes; also small brown beetle, not captured. One *V. antiopa* and one sulphur yellow butterfly, but these fellows show no disposition to hunt cover, though it is going to be colder and storm. (Note: It was and did. It would be interesting to know if many of these insects did not suffer from the sudden change and their inability to find shelter.)

November 24. Cutting up an old pump stock with a closed end, I found a large crane fly hanging within. Breathed on it without result; its senses probably returned, but it was too scared to move. Took it into warm room; in ten seconds it revived and took wing to the window.

January 7. Put a *Cecropia,* hatched indoors, into a ball of snow and left it on outer window sill for an hour. Very cold. Inside removed snow and in a few seconds moth was fanning its wings. Encased it in snow again and left it out overnight. Thermom. 15 above zero.

January 8. Snow encasing moth turned to ice. Coated same with salt until partly melting it; then broke it open with difficulty, but without injuring the moth. Body of moth stiffened as a dried specimen; one leg snapped off when slightly pulled. Dipped moth in warm water and it revived in six seconds, able to fly strongly. Took twenty-one insects of six species and four orders: house flies, flour beetles, bean weevils, one clothes moth, one butterfly, little red ants, enclosed them in small metal box and placed them on north window sill, outside, for three hours. Thermom. 22. All appeared dead. When brought into warm room all but two ants and two flour beetles recovered quickly. Subjected chrysalis of *P. turnus* to snowball treatment for one hour outside. Life returned in a few seconds in a warm room so that the abdomen moved from side to side when touched.

February 15. Very warm, like day in May. Was startled to hear notes of katydid in woods and located same in beech tree with large bunches of adhering dead leaves. Insect stopped calling when tree was jostled. Returned to house, got saw, climbed tree and cut off five leaf bunches before finding insect in mass of leaves. Insect difficult to discover; it had become almost as yellow as the leaves. (Note: The specimen shows green edges to the wings and green on the prothorax and part of head; also on the rear femora.) This fellow, overlooked by the migrating and winter birds because of the adhering leaves, did not as usual fall to the ground and become a prey to terrestrial birds and quadrupeds.

April 2. Found adult Chloealtis grasshopper in field. This specimen wintered somewhere in a safe place, as the species does not normally reach the imago stage until midsummer and later. I have frequently observed Aeschna and Tramea dragonflies very early in the spring. It would be interesting to know whether these emerged through the pupal cases so early or hibernated, but it hardly seems that they could escape the winter birds.

BABY SHRIKES—A PRIZE-WINNING PHOTOGRAPH IN THE NATURE MAGAZINE PHOTOGRAPHIC CONTEST—SNAPPED BY LAWRENCE D. HIETT, TOLEDO, OHIO

WASHINGTON CHRISTMAS TREES

BY RUSSELL T. EDWARDS

FOR AGES the evergreen tree has been the symbol of the Christmas spirit. There is no reason why it should not continue to be. Properly gathered the annual Christmas tree crop has little or no bearing on our timber resources. In fact, where conifers are cut in the forest they may render a service as thinning, thus allowing the remaining trees more room to grow. Also the growing of Christmas trees is becoming a business through which many farmers are putting idle acres to work producing little firs, pines and spruces. Some trees are, of course, still pilfered from private property, but the check on this is merely enforcement of the law.

There is another interesting tree movement in connection with our Christmas observances–the outdoor Christmas tree. In the yards of many homes the Yuletide tree lives and grows, serving from year to year. The community Christmas tree has recently gained wide popularity since it provides the focal point for group celebrations. And this year and next the planting of permanent Christmas trees is taking on a new meaning because many of them are being dedicated to the memory of George Washington in observance of the bicentennial year of the birth of our first President.

The call of the American Tree Association for ten million trees to be planted and dedicated to the memory of Washington in 1932 has met with tremendous response. The goal is being rapidly approached and will surely be surpassed. But the community Christmas tree offers to women's clubs, service organizations and civic groups a particularly appropriate opportunity to plant a valuable memorial to Washington. So, also, may the individual place a Washington Christmas tree on his own home grounds and register it with the American Tree Association in Washington.

In Flint, Michigan, the Junior Chamber of Commerce is planting evergreen trees on the grounds of every school in the city and will dedicate these Christmas trees to George Washington in 1932. Richard Wagner of Oakland, California, is making a present of Washington Christmas trees to his friends and enrolling these friends on the national honor roll of bicentennial tree planters. There is the work of the clubwomen in Council Bluffs, Iowa. Mrs. E. J. Towslee reports the planting of evergreens in every school yard in that city. As for good will and trees, vision the meaning of the three trees just planted as Washington Memorials by Joseph C. Grew, Ambassador to Turkey at the embassy in Istanbul. Such ideas as these indicate the possibilities of the Christmas tree in connection with the observance of 1932.

THE LIVING CHRISTMAS TREE

It lends itself to community celebration and is a gathering place for other events

In the Bicentennial Tree Planting Book, which is available free from the American Tree Association, 1214 16th Street, Washington, D. C., are suggestions for those who wish to combine Christmas tree planting with the Washington memorial plans. Hardly a more fitting tribute could be paid, through which, from year to year, the ideals of Washington will be kept glowing wherever the living trees continue to speak their message of good will.

HARD SCRABBLE

THEODORE F. LANGE'S CONTRIBUTION TO WILD LIFE CONSERVATION

BY A. O. LEUTHEUSSER

This is another story in the series on the Nature hobbies of interesting and eminent people.

IT IS indeed gratifying to the Nature lover that in this hour of need in which many species of birds and animals find themselves, a keen and widespread enthusiasm has been aroused among men and women in all walks of life, acting individually or in organizations, to stay the slaughter of the wild creatures, whose presence gives soul and meaning to field and wood, by furnishing them sanctuary on inviolate preserves.

One of those who loves birds and other forms of wild life and who is doing something to aid in their preservation is Mr. Theodore F. Lange, publisher and banker, of St. Louis, Missouri.

A dozen miles below the southern limits of the city, he established, some years ago, a wild life sanctuary on a twelve-acre tract of rolling woodland topping the limestone escarpment skirting the Mississippi River. The mighty stream, stretching like a silver ribbon from Canada to the Gulf, is the great midwestern highway for bird migrants. Not any more, however, do we see, as our forefathers did, the vast flights of ducks, geese and swans and lesser species threading their way over its waters and populating the mid-river sandbanks both spring and fall. The swans are gone, and what survivors are left of the other large game birds have become extremely gun-shy. They fly high over the blinds on the bars and often travel by night, when their wild honking comes down to us as eerie voices from the dark.

But most of the small birds still come in abundance. They are keen to sense the security of Mr. Lange's woodlot, and nearly every habitant and visitant species known to the region has been noted at one time or another. A bird "cafeteria", well stocked the year around with grains and suet, is a prime attraction and both winter and summer hungry visitors come here to dine in a never-ending procession. Quail, bluejays, juncos, cardinals, tree sparrows, bluebirds, sapsuckers, downy and hairy woodpeckers and nuthatches are resident boarders throughout the winter months. The deep, wooded ravine that winds through the estate to the river bank offers a warm retreat by day as do the clumps of native juniper which were planted for the purpose. Numerous bird houses give protection against chilly night winds.

In the warm months the picture of bird life is complete. In that part of the sanctuary left untouched by the axe and the grubbing-hoe, where thickets of sumach, brambles and weeds run riot, such ground-loving birds as thrashers, chewinks and song sparrows build their nests, and in the wooded area, tanagers, grosbeaks, warblers, orioles, and many other songsters flit about intent upon their family affairs. Martins, woodpeckers, crested titmice and bluebirds, not to mention the ubiquitous sparrows, occupy the bird houses.

The four-footed folk of the wild also have learned of the inviolability of this spot. A family of raccoons has taken up its abode in a cavern under the rim of the bluff and are often seen at dusk foraging about under the scrub oaks. An opossum with her clinging brood was once observed, silhouetted against the fall moon, gleaning a feast from the topmost branches of a persimmon tree

THE CABIN THAT SERVED AS CHURCH AND SCHOOL

It was transported to Hard Scrabble, the Lange Bird Sanctuary, from the spot where it had stood for more than a century. Mr. Lange, himself, stands on the doorstep

overhanging the bluff. One morning at dawn, Mr. Lange surprised a red fox sitting on the rim of an outdoor aquarium intently concerned with the possible capture of the goldfish swimming about under his nose. Gray squirrels are not too numerous for the safety of eggs and fledglings, thanks to their roving beyond the boundaries of the refuge, where they fall prey to hunters. A hollow tree has for years housed a family of silky, lustrous-eyed flying squirrels who can be persuaded to make a daytime appearance by knocking on their door. Some marauder, probably a mink, but whose exact identity could not be learned from the remains of a midnight feast in the hen-coop, pays an occasional visit to the preserve. Some of these creatures are destructive to bird life, but it is Mr. Lange's policy not to disturb the balance of Nature, and neither gun nor trap is permitted on the premises. Responsive to the care and protection afforded them, most of the wild creatures have lost much of their fear of man and can be freely approached for observation of their habits.

Except for a level area surrounding the two buildings on the site, the grounds have been left as Nature made them. Post oaks, red oaks, black jacks, ash, persimmon and hickory, with a sprinkling of sumach, dogwood and red bud, form the larger part of the stand of native trees. Throughout the growing season the ground is carpeted with a procession of wild flowers, some of which have all but disappeared from the environment of the city except in such protected localities as this. False foxglove, blazing star and hepatica are still abundant here. Cassia, cone-flower, beard-tongue, bird-foot violets, bloodroot, dentaria, goldenrod, asters, the curious walking fern and the purple-stemmed cliff brake are among the conspicuous examples of the varied flora.

In keeping with the primeval condition of the sanctuary, Mr. Lange has erected a log cabin that is a replica of those constructed in the country round about by the first settlers. The logs were obtained from one of the oldest churches built west of the Mississippi. It was built by pioneers in 1826 near the present town of Kimmswick, situated a few miles below on the river. Although over a hundred years old the seasoned logs are still sound. In dismantling the old log church, which was used for a time for a schoolhouse, a curious relic of bygone times was found. This was a scrap of writing tucked away in a crevice by an old schoolmaster. It reads: "Be it known, that I, Williams Hopkins, do agree to teach school in this Cabin, beginning October first, 1832, and continue twelve weeks of five days each week, provided that fifteen scholars at two dollars each be subscribed. I am qualified and will undertake to teach Spelling, Reading, Writing, Arithmetic, and Geography, and will see to good behavior of each child. The father of each child must help to supply the necessary fuel. It is, however, expected that children living beyond four miles be kept in boarding by neighboring settlers. Not to forget that I can also cut the quill for good penmanship."

The interior of the cabin is reminiscent of the simplicity of life in the old pioneer days. The ample fireplace with its swinging crane and hob, the flint-lock rifle over the mantel, the spinning wheel, the rude table with its settles, the old pewter and china, all call back the days when life was less comfortable but more wholesome than now. From the windows of the cabin as a point of vantage the happy owner can survey the comings and goings of his feathered friends, read the season's progress in the blooming of the wild flowers, and claim as his reward for their protection the perennial pleasure that comes from giving them sanctuary.

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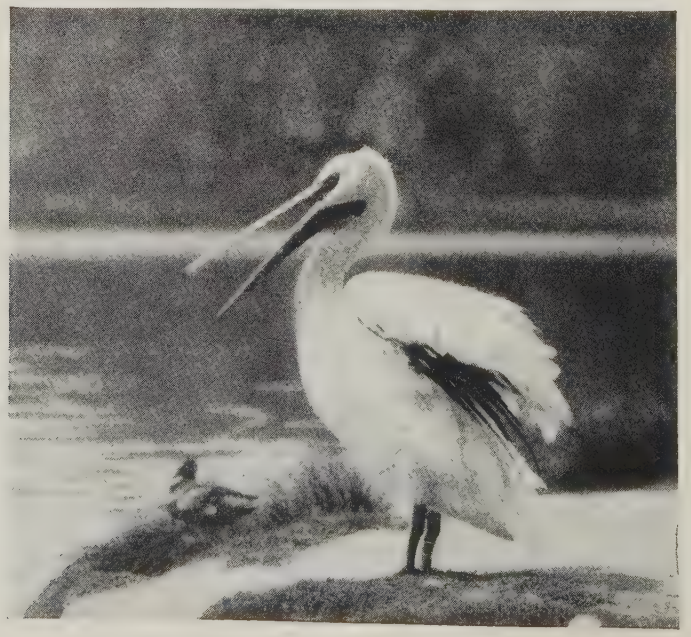


WHITE PELICAN, EITHER BORED OR HUNGRY?

PRIZE-WINNING PHOTOGRAPH BY C. W. FAULL

TORTURED, THAT WOMEN MAY SMILE!

BY HENRY R. CAREY

ILLUSTRATIONS BY
R. BRUCE HORSFALL

This article and the one immediately following it are presented because they cannot fail to be of interest to anyone sincerely interested in conservation of wild life and humaneness. Mr. Carey, a former diplomatist and member of the bar of Pennsylvania, has written a vivid story. Miss Bull has presented some illuminating facts on furs and what they really are

RALSON'S prolonged absence from camp caused no alarm at first. Trappers in the Canadian wilderness are used to such unexpected events. True, Ralson was but a boy—a green hand just over from England—and Hudson's Bay Company bear-traps are difficult and dangerous even for an experienced woodsman to set. But the lad, though he had been in some scrapes, had in general shown considerable quickness in acquiring the various skills of the Northern *voyageur*. After all, he had been away from headquarters only forty hours. As time wore on, however, a terrible suspicion wormed its way into the minds of his two companions. Not caring to voice their thoughts, they hurried off to the nearest bear-trap, which was about a mile up the creek. When they came to a soft place on the trail and saw only footprints of a man going and none returning, their presentiments seemed confirmed. Now they almost ran along the dim trail. In their haste, it seemed to them that the trees and bushes caught at their clothing and tried to hold them back. At last they broke into a small open space. There was the bear-pen in which the trap had been set. Near it lay a pocket knife, with broken blade. Some one had evidently thrown the useless thing there. Just in front of the pen some creature had been digging desperately in the sand. Had Ralson, crazy with thirst, been delving with the knife for a few precious drops of water? As they looked in at the door of the pen their most hideous fears were realized. There on its back, smeared with blood and sand, swollen almost beyond recognition by mosquito poison, and absolutely motionless, lay what remained of the boy Ralson! The remorseless steel teeth of the 60-pound bear-trap, biting into the bone, held one leg above the ankle. A cloud of buzzing, shiny-blue meat-flies rose, protesting, from the body as the trappers leaned over it. In another hour perhaps the crows and ravens would have been at it. They saw how he had hacked at the strong birch drag to which the trap chain was fastened, until his knife had snapped. Then evidently he had given up in despair.

Luckily his companions were men trained to quick thought and quick action. Upon examining their youthful pal, they found evidence that a spark of life still remained in the unconscious, pitiful wreck. Working together they quickly removed the heavy mass of metal from the tortured leg. One ran to the stream for cold water, while the other twisted birch-bark into a funnel, through which they allowed the water to trickle very gently into the parched throat. Next they bathed and washed his face and hands. Soon, Heaven be praised!,

he opened his eyes. Now, as they held up his head, he was able slowly to drink. The blessed water, followed by tea and partridge broth, helped him to regain some strength. Finally they cut the boot from the poor swollen foot, bathed it and bound it up. Tenderly they lifted the limp boy upon an improvised stretcher, and thus they carried him to the canoe, and home to the fort.

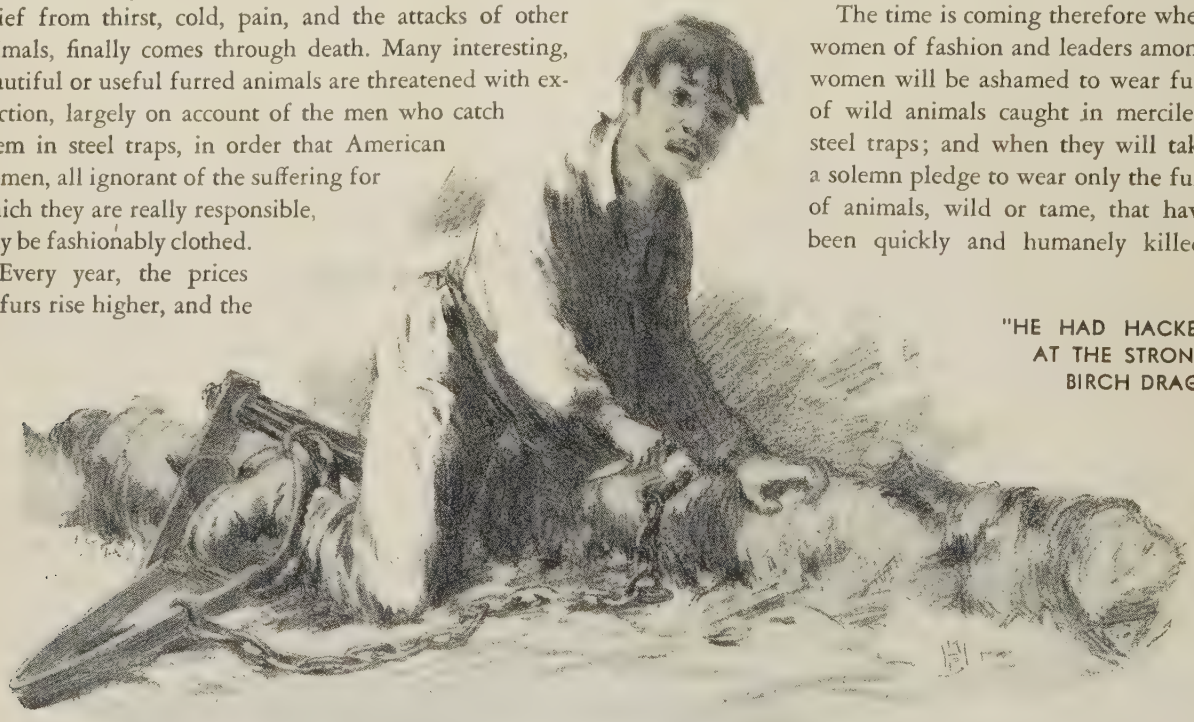
Ralson never trapped again. That was scarcely an experience that one would care to repeat. Few parents would wish to have a child of theirs risk it a second time and doubtless Ralson's mother was overjoyed to see him once more in England, after his leg had healed. This story, by the way, is true. It has been condensed from the account of Martin Hunter, who was for years a seasoned woodsman and commissioned officer of the Hudson's Bay Company.

Literally millions of wild fur-bearing animals, in America alone, suffer every year from similar prolonged torture, hour by hour, and sometimes day by day, until relief from thirst, cold, pain, and the attacks of other animals, finally comes through death. Many interesting, beautiful or useful furred animals are threatened with extinction, largely on account of the men who catch them in steel traps, in order that American women, all ignorant of the suffering for which they are really responsible, may be fashionably clothed.

Every year, the prices of furs rise higher, and the trappers go farther and farther into the wilderness after the defenseless animals. Even the squirrels of Siberia, whose skins are too tender to be of the slightest use for durable furs, are killed in large numbers, so that women may wear squirrel coats for a short season, before they tear into pieces, as they do with even the small exertion of driving an automobile. Such wholesale slaughter, pain, and waste has perhaps never before disgraced a supposedly civilized nation! America now leads the world in the fur trade!

It is time to stop and think what we are doing; to think of the empty, lifeless woods to which we, and our children and grandchildren will have to go, when we have fled the noise of our machine-age cities, for a brief vacation in the wilderness! And, above all, to think of the slow torture, which civilized countries no longer inflict upon men, but which is now reserved for wild animals, with the pitiful excuse that these, whose senses are often keener than ours, do not feel pain as we do!

The time is coming therefore when women of fashion and leaders among women will be ashamed to wear furs of wild animals caught in merciless steel traps; and when they will take a solemn pledge to wear only the furs of animals, wild or tame, that have been quickly and humanely killed.



"HE HAD HACKED AT THE STRONG BIRCH DRAG"

WHAT FUR NAMES MEAN

BY JEAN INGLIS BULL

IT WOULD be impossible to find a time in history when man was not wearing furs. Undoubtedly he wore them long before time was recorded. And he had a good reason in those days for taking the lives of his less clever brothers. He needed their fur for warmth, to protect himself.

Today most of us wear furs because they are beautiful in themselves, are flattering to us, and because we find them everywhere for sale. We seldom stop to think of the animals that produced the fur, whether they were raised for that purpose and humanely killed or whether they had to fend for themselves in the world and were caught in a trap. We never consider how reluctantly and most painfully the wild animals gave their lives to supply us with a luxury. We forget to think of the forests, the meadows, the high, windy tablelands lonely without them. We never see the cruelty of the trap, skillfully-hidden to betray them, or hear their cries that follow the first sharp surprise at their capture. We seldom think of their futile struggle to be free, their frantic dashings

about, their final, inevitable exhaustion. Little creatures forced to die in agony that selfish unthinking mortals may satisfy a whim.

Much of this cruelty can be avoided if we interest ourselves sufficiently to know what we are buying. It is quite possible to dress ourselves in most attractive furs, and with the clear conscience that comes from knowing that all wanton cruelty has been avoided. We can purchase furs of only domesticated animals, raised and cared for by man, and whose flesh usually has been used for food. Some of our most beautiful and stylish furs, such as Broadtail, are from domestic animals. It is true also that methods of preparing and dyeing fur add greatly to its beauty and durability. Rabbit, for instance, is treated in many different ways to simulate more costly furs. In short, by confining ourselves to furs of domesticated animals we can have beautiful garments without causing the torture of animals. And, naturally, we will need to pay less for these than for the skins of rare wild animals brought from the distant wilderness.

The only sure way to know what we are buying is to learn the trade names under which the skins of most domesticated animals masquerade. Although the more reliable merchants do not misrepresent their wares, there are others who are not so conscientious. In many cases, also, fur products are retailed by clothing or department stores, more or less as a side line, and by people who know little, and may care less, about the true source of their wares, or the ethics involved. It is therefore well for the purchaser to be fortified by first-hand knowledge concerning the fur whose name may suggest a rare wild animal taken on the drifting arctic ice-floes, or in the wintry forest or barren heights of some far-off land of desolation—when in truth it came from a rabbit hutch in some village yard. The fur of a rabbit, as we have said, may be made up most attractively, but there is no reason why one should pay a high price for a rabbit-skin, even though it may be called chinchilla, or Arctic fox.

All names in the following list are compiled from authoritative sources. Under the heading of rabbit are included the common domesticated rabbit or "Belgian" hare, a native of Europe, imported into Australia and other countries, and now raised widely for its meat and fur; also certain wild hares and rabbits, in some cases species that must be reduced for economic reasons. It is to be understood that in many cases the skins are dyed to imitate the animal suggested, or that the skins of young or even unborn animals, perhaps sheared or otherwise changed, or with hairs of another species inserted, may be used.

The following furs were originally rabbits: American Seal, Arctic Seal, Australian Cony, Australian Rabbit, Australian Seal, Baffin Seal, Baltic Black Fox, Baltic Brown Fox, Baltic Leopard, Baltic Lion, Baltic Red Fox, Baltic Seal, Baltic Tiger, Baltic White Fox, Bay Seal, Beaverette, Belgian Beaver, Black Hare, Black Lynx, Black Seal, Bluerette, Buckskin Seal, Cape Seal, Castorette, Chapchillas, Chinchilla Rabbit, Chinchillette, Clipped Seal, Coast Seal, Cocoalette, Cony, Cony-Beaver, Cony Kit, Cony Leopard, Cony-Mole, Cony-Seal, Ermiline, Erminette, Fox Hair, French Beaver, French Chinchilla, French Cony, French Leopard, French Sable, French Seal, Galland Squirrel, Geller Seal, Hair Fox, Hair Sable, Hare, Hudson Bay Seal, Imitation Ermine, Jap Rabbit, Kit Cony, Lapin, Laskin Seal, Le Meuse Seal, Leopard Cony, Leopardine, Mar-Konie, Marmotine, Mendoza Beaver, Minkony, Molin, Moline, Muskratine, Near Seal, New Zealand Seal, Northern Seal, Nu Nutria, Nutriette, Polar Seal, Polo Seal, Red River Seal, Roman Seal, Russian Leopard, Russian Taupe Fox, Sable Hair, Seal Musquash, Sealette, Sealine, Southern Seal, Squirrelette, Squirreline, Twin Beaver, Visonette.

Sheep serve to provide the following furs: Afghan Lamb, American Broadtail, American Wombat, Astrachan, Bagdad Lamb, Beaver Lamb, Bokhara, Broadtail, Caracul, Caracul Paw, Chekiang Lambskin, China Lamb, Dahtung Lamb, Galyak, Half Persian Lamb, Iceland Fox, Iceland Lamb, King Broadtail, Krimmer, Lacoon, Laskin European Lamb, Laskin Lamb, Lawressa Lamb, Leg Cross, Lincoln Lamb, Lykkoon, Mandel, Manderian Lamb, Mand-o-coon, Mediterranean Sheep, Merlushka, Mongolian Lamb, Persian Lamb, Persian Paw, Pieced Persian Lamb, Pro-

cessed Broadtail, Queen Broadtail, Salt Persian Lamb, Salzfelle, Shantefu Lamb, Shearling, Shiras, Slink or Lincoln Lamb (usually foetus), Thibet, Thibetine, Tibet, Triebel, Ukrainer Lamb, Wombat Lamb.

Goats provide the following: Blue Japanese Wolf, China Bear, Chinese Goat, Ercomine (Imitation Ermine), French Wolf, Dalyak, Giraffe Kid, Goat, Kid Caracul, Kid Cross, Kid Skin, Leopard Kid, Leopardine, Moufflon.

We draw upon the alpaca or South American "camel" for: Alpaca (form of guanaco specialized for wool), Guanaco, Llama (dyed to imitate Fox or Wolf), Guanaquita.

Dogs are transformed into: Belgian Lynx, Black Poiret Fox, Chinchow Dogskin, Chinese Dogskin, Isabella Fox, Manchurian Black Fox, Manchurian Dogskin, Manchurian Fox, Manchurian Poiret Fox, Manchurian Wolf, Newchwang, Wolfox.

Cats provide Black Cat, Cat, Domestic Cat, Genet, House Cat, while the horse gives us the Russian Pony, and the cow—Calf and Karova.

• • •

TO THE VICTORS BELONG THE SPOILS

WHEREIN THE ANTS VANQUISH THE BEES AND GET THE SUGAR

BY ROMANIE VAN DE POELE

We had had four days of beating rain, and then a real Cape Cod blow which lasted a week, but now the air was clear again, and I ventured down under the sun-dappled shadow of the birches, a stone's throw from a blue lake, where stood the white hive of my Italian bees. I had recently divided and requeened, and was expecting that in nineteen or twenty days the downy yellow babies would be sunning themselves on the porch, preparing to take up their duties as nurses until their wings should be strong enough to go fielding. But in the meantime, I knew the rough wind was taking a terrible toll of my old fielders. And I found the expected,—the wings of the faithful little creatures were all worn and shaggy and they came back from their trips so exhausted that they lay awhile throbbing on the alighting board before going into the hive with their nectar and pollen. Then they would soon struggle out and off again for another load.

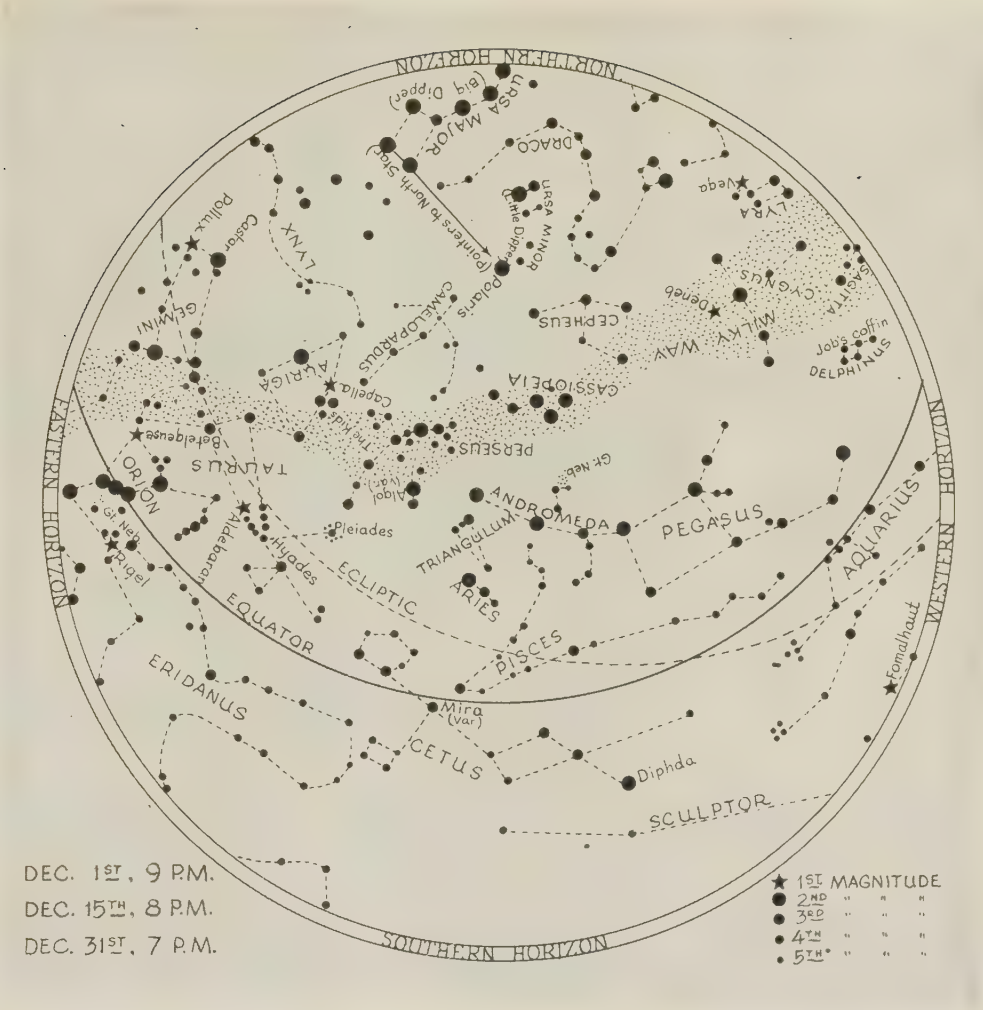
THE BATTLE OF THE SUGAR-LUMPS
The ants invaded the hive, flung themselves on the bees, and finally forced them to throw the sweets out of the hive

I knew that there was hunger in the hive by the peculiar, irritated song that they sang when I ventured near. So I gingerly poked a dozen pieces of lump sugar under the entrance. In a moment the sugar was black with bees testing and nibbling my provender. They crowded around it, dragging and pushing until it was all well within the hive. Some stood on their heads, waving their black legs, the bees' expression of high elation, on the discovery of these riches. I was delighted with the success of my sugar party, and went away with high hopes.

An hour later, I returned to see if they had resumed fielding but I found a battle raging. A large army of black ants had invaded the hive, and the bee guards were frantically running to and fro, unable to stem the tide of warrior hosts. The poor bees were at a disadvantage against the strong nipping pincers of the ants. Wave after wave of the attackers drove through the citadel. "To the victor belong the spoils" seemed to be their slogan. The ants had respected the bees' right to the honey store, but sugar was contraband. They had smelled the difference, though the hive was above the ground, and had thrown their legions into the fray.

I was just about to poke the sugar, *casus belli,* out of the hive, when the bees, vanquished, and tired of giving their lives for nothing, thought of the same thing. They pushed and pulled, tugged and shoved, until every last bit of the sweet tumbled overboard, and the black invaders followed it out on the grass, and there feasted in triumph.

Then was peace in the hive. The old folks talked the battle over. They capped the cradles where the fat grubs were preparing to weave themselves a coverlet while their legs and wings grew, and their backs became banded with yellow down. They buzzed contentedly now, and the fielders swept outward once more on their search.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

DISCOVERING COMETS

AN INTERESTING PASTIME FOR THE AMATEUR ASTRONOMER

BY ISABEL M. LEWIS

NAGATA was the foreman on a melon ranch in California. He was a Japanese who cherished an interest in the heavens. Often of a soft, clear evening he would take his three-inch telescope from its case, screw on the eyepiece that magnified thirty times and train it on the sky. One night he was studying the planet Neptune and noted a strange, fuzzy, star-like object. The next evening he looked again and this object had moved. This was interesting and he strongly suspected that he was viewing a comet. He notified the astronomers at the Mt. Wilson Observatory. They looked through their powerful telescopes and there it was, a comet and no mistake. But Nagata had discovered it and, as is customary, it bears his name and goes into astronomical records as Nagata's Comet.

So, indeed, the discovery of comets is not limited to professional astronomers. The great southern comet of 1910 was first seen by three workmen on a South African railroad. And there are people who make a regular business of comet-seeking, usually using small telescopes of low power but systematically sweeping the heavens in their search. Even a telescope is not absolutely essential, because some comets may be picked up with opera glasses, but one should have a thorough knowledge of the constellations gained from a good star atlas.

Comets frequently are tailless, especially if they are small or at a considerable distance from the sun when discovered. The tail is usually developed as the comet draws near the sun and is produced as a result of the pressure or light from the sun upon fine particles of matter in the head of the comet. For this reason a comet's tail is always turned away from the sun and as it recedes

from the sun its tail precedes it. A comet may be distinguished from a nebula, which it strongly resembles when it is small and faint and tailless, by the fact that it will be seen to move with respect to neighboring stars even in the course of a few hours. If one is satisfied that he has actually discovered a comet the nearest observatory should be notified of the approximate position of the object. The constellation in which it lies should be named as well as its position with respect to some neighboring star. After one has learned from the monthly star maps the forms and outlines of the principal constellations he may readily identify, with the aid of a star atlas, the positions of fainter or less conspicuous stars with respect to stars he already knows. Not only comets but Novas—new or temporary stars—have been discovered by amateur astronomers who have become so thoroughly acquainted with the forms of all the constellations and the relative positions of all the brighter stars that they recognize immediately the presence of any new or unusual object in the sky.

In general only the brighter and more conspicuous comets are discovered with the naked eye or with small telescopes. Many comets, especially those known as periodic comets, which return regularly to the sun at intervals of a few years, are expected and watched for. Such comets are usually first seen photographically as small nebulous objects on a plate that has been exposed to that part of the heavens in which the comet is due to appear. The most interesting of all comets, however, are the unexpected comets that may appear at any time in any part of the heavens. As the path in which such a comet is travelling is unknown and cannot be determined until three observations of its positions have been made, it is important to have its discovery reported as soon as possible. Its approximate position when discovered is then telegraphed to a number of leading observatories and a bulletin announcing its discovery is issued from the Harvard College Observatory, which is the clearing house for such information in this country. Additional observations of the object are then secured and with the positions obtained a "search ephemeris" of the comet is computed so that it may be followed from day to day and a number of observations made. It has sometimes happened that a comet has been seen once and then lost because it was not possible to observe it again either due to continuous cloudy weather or because it was lost in the rays of the sun. At the time of the total eclipse of the sun of May 17, 1882, a small comet with a conspicuous tail was photographed on the same plate with the solar corona but this comet was not seen again. Many comets sweep up from behind the sun, swing rapidly around it, and recede without being well observed because of their unfavorable position as seen from the earth.

As soon as the astronomer has three observations of a comet's position, even if only a few hours apart, he can tell when it will be nearest the sun or at perihelion, as it is called; how far it will be from the sun at that time; how fast it is moving in its orbit and in what direction; how near it will come to the earth and when, and some other interesting facts about it. Its future positions can be predicted so that everyone may know when and where to look for it.

Every year, on the average, four or five comets are discovered. Some of these are periodic comets. Their returns have been predicted and generally they appear as expected, although in some cases they have passed so close to one of the planets since their last return that the planet has disturbed their motion and even seriously altered the forms of the orbits so that they do not return when expected and in some instances are never seen again. Jupiter, the largest planet and the most massive, is the chief offender and has a large family of captured comets. It has, in addition, so changed the form of other orbits that the comets have been driven completely out of the solar system.

Great and spectacular comets, so large and brilliant that they may be seen even in daylight, are rare. No periodic comets belong to this class with the exception of Halley's Comet which has been returning at intervals of about 77 years for centuries. At its last return in 1910 this comet was a magnificent object with a tail at one time reaching nearly from the horizon to the zenith. Most periodic comets, however, are never visible without the aid of a telescope. They have been disintegrated and scattered along their paths in the form of meteoric dust in some instances and when their orbits intersect that of the earth they produce periodic showers of meteors.

Even the greatest of comets have been described as "airy nothings." Although the bulkiest of all celestial bodies, they are the least massive. They shine partly by their own light, due probably to electrical excitation, and partly by reflected sunlight. The head of a comet probably consists of a cluster of meteoric stones loosely held together by their mutual attraction and mixed with gaseous vapors and finely divided particles which are continually being driven off from the head by light pressure to form the tail. So rarified is the matter of which the tail is composed that its density is less than that of the best vacuum we could produce. The tail of a great comet is its most imposing feature. If visible to the naked eye it is rarely less than ten million miles in length and in exceptional cases the tail would more than reach from the earth to the sun. The earth has been known to pass through the tail of comets without any noticeable effects and it is quite certain that it at least grazed the tail of Halley's Comet in 1910. The chance of a head-on encounter between the earth and the head of a comet is probably less than one in a million, but if it were to happen it would be a much more serious matter than an encounter with the tail. There may be masses weighing many tons loosely held together by their mutual attraction in the head of a comet and if these were to penetrate our atmosphere the resulting bombardment of the surface might prove decidedly uncomfortable for some of the inhabitants of our planet, but one need not give any serious consideration to such a possibility.

This month Venus is again coming finely into view as an evening star. On the fifteenth, (Continued on page 383)

Helps and Hints

FOR HOME AND GARDEN

PLANTING THE GARDEN, MONTH BY MONTH

By Romaine B. Ware

December is a month of retrospection and contemplation for the gardener. Most of the outdoor work is done. Safely intrenched before the fireplace we not only look back over the past year but also forward to next season. No matter how good the garden grew this year we plan for a better one. If you did not plant all you intended to last fall, make plans for spring planting. Never be satisfied with your garden because when it reaches that stage you will lose interest in it. Keep changing your garden, improving it, adding to it. The garden that is kept up-to-date never loses interest; each spring finds us awaiting the unfoldment of some new treasure, planning some new feature.

Actual gardening throughout most of the country at this season is limited to those who are the happy owners of greenhouses. They need not be elaborate; in fact, many a handy amateur has built himself a small greenhouse and from it derived a measure of garden joy far beyond its cost. Lean-to houses may be added to the garage or they may be built on to the south side of the house. Extremely attractive, ready-made units are available at a cost comparable to that of a medium priced automobile and more and more we find them being built as attractive additions to the dining room or sun room.

A greenhouse of moderate size can easily accommodate a wide variety of plants among which the following are representative: sweet peas, wallflowers, tulips, narcissuses, azaleas, stocks, lupins, carnations, snapdragons, chrysanthemums, calendulas, ferns and others. A small, well planned greenhouse can be cared for with a minimum of an hour daily though once you become thoroughly interested you will want to devote more time to it.

This is the season to start seeds of clarkia and godetias in the greenhouse; schizanthus, gloxinia and heliotrope seeds may also be sown now as they germinate slowly. Lilies-of-the-valley may easily be forced from roots available at seed stores. They need partial shade and at least seventy degrees heat. The small greenhouse is invaluable to start annual seeds early in the season that they may be had in quantity for the garden.

If the soil is not frozen in your garden, many varieties of bulbs may still be planted. The Japanese lilies, auratum and speciosum are among these and should be found in every garden. Both varieties require deep planting, ten inches at least.

(Continued on page 381)

Christmas Greens From Vermont

WREATH NO. 5

There are no gifts which will give more sincere pleasure than those made from fragrant and beautiful evergreens decorated with cones and red berries. They fill the home with the very spirit of Christmas and happiness, and those made of balsam will last all winter.

Special Evergreen Boxes

Containing 12 to 18 inch sprays of assorted evergreens and also some cones and red berries, they make an ideal gift for a city friend, who will delight in arranging artistic vases, baskets, and wreaths.

Box No. 1 cont'g 50 assorted sprays $ 2.75
Box No. 2 cont'g 100 assorted sprays 5.00
Box No. 3 cont'g 250 assorted sprays 10.00

Christmas Wreaths

No. 0 7-inch wreath for automobiles. $0.50 each

No. 1 12-inch wreath with five cones and five sprays of berries. $1.00 each

No. 2 15-inch wreath with six sprays of small cones and six sprays of berries. $1.50 each

No. 3 20-inch wreath with five large cones and five sprays of berries. $2.50 each

No. 4 20-inch wreath with continuous decoration of cones and berries. More elaborate than No. 3. $3.50 each

No. 5 A large 26-inch wreath, built on frame for store or cemetery use, decorated with many cones and berries. $7.00 each

No. 6 30-inch wreath similar to No. 5, but much larger. $10.00

Living Christmas Trees

Symmetrical little trees which may be planted outside after being used for Christmas trees. Please order live trees early, before the ground freezes too hard. Your choice of Norway Spruce, White Spruce, or Balsam.

12-18 inch trees	**$1.00 each, $10.00 per 12**
18-24 inch trees	**1.50 each, 15.00 per 12**
24-36 inch trees	**2.00 each, 20.00 per 12**
3 to 4 Ft. Norway Spruce	**3.00 each**

Handmade, Vermont Baskets

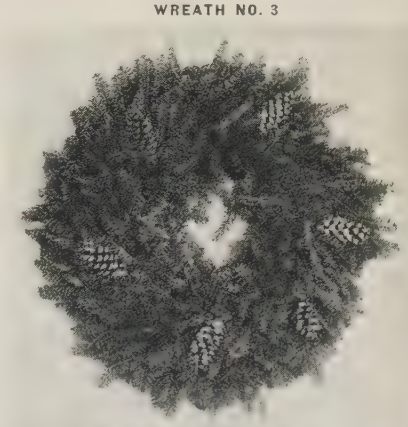
Over twenty kinds of useful baskets made right here in Putney by old-time, skilled basket makers. Only the finest oak and ash lumber is used, and these baskets are so strongly made that they may last a lifetime.

Why not give your Thanksgiving and Christmas presents in useful baskets? They are all priced in our new holiday list.

If you will send now for our new list, you will find that we also offer Fireplace Cones, Table Trees, Balsam Pillows, Made-Up Sprays and Baskets, Cut Evergreens in variety for church or street decorating, Balsam Roping, and even Butternuts and Popcorn—all products of the Green Mountain State.

Our prices are f.o.b. Putney. If you wish to send gifts to friends we will prepay charges and you can then remit the costs to us.

WREATH NO. 3



GEORGE D. AIKEN Box Z Putney, Vermont

GIFT Suggestions for Nature Lovers

THE CHRISTMAS GIFT of a practical nature may be even more acceptable than the frivolous one if it is selected to suit the taste or hobby of the recipient. The advertisements on this page offer a varied and unusual selection.

Direct from the native weavers

Colonial Coverlets

at new Reduced Prices

With infinite care, the native Vermont weavers have reproduced this authentic "Whig" pattern in purest native wool on firm non-shrinking warp. Design and texture combine to flood the room with rare and restful Early American charm. Made in Indigo Blue, Whig Rose, Green, Old Blue, Lavender or Gold. 66" x 96" (Single bed), $10.25; 80" x 96", $11.50; 65" x 108", $10.75; 80" x 108", $12.25. Postpaid to Mississippi River; beyond, add 25c. Satisfaction guaranteed.

Send for catalog of Blankets, Slumber Throws and other Heirloom Woolens made by the woolcrafters chosen to supply blankets for the new de luxe Waldorf-Astoria Hotel.

VERMONT NATIVES INDUSTRIES
Shop 4 **Bridgewater, Vermont**

AN IDEAL XMAS GIFT

for any boy or girl who collects butterflies, moths or other insects.

This set contains all the necessary material for collecting and preserving specimens.

1 Butterfly Net
1 Spreading Board, adjustable
2 Riker Mounts—8½ x 12 and 6½ x 8½
1 Large Cyanide jar
250 Assorted pins
1 Book of Instructions

Complete at $5.00

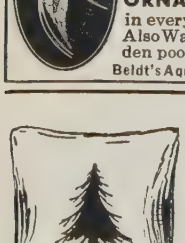
STANDARD SCIENTIFIC SUPPLY CORP.
10-14 West 25th St., New York.

TROPICAL & FANCY GOLD FISH

Make gorgeous displays in your home. Our 56 page free book shows 50 varieties of fancy fish in actual colors.

ORNAMENTAL AQUARIUMS in every size and style; fish supplies. Also Water Lilies; everything for garden pools. Ask for catalog. Address

Beldt's Aquarium, 2143 Crescent St. Louis, Mo.



A BALSAM PILLOW

from the Adirondack Mountains makes a most delightful gift. We crowd the fragrance of the forest into a beautiful green, rose or gold silk, hand-painted cover.

1 lb. 8 inches square size is $1.00
2 lb. 11 inches square size is $2.00

Postage prepaid within the third zone. Include additional for points beyond. No C. O. D. order accepted.

CAMP PAYNE
Box 173 **Inlet, New York**

Christmas Cards of Wood

Six unusual cards made of six different woods; flexible, fascinating, almost transparent. Delightful designs and greetings. Complete with envelopes, correspondence cards and an illustrated folder.

Sent postpaid for $1.00

B. L. MADDEN **LOWVILLE, N. Y.**

The Bear with Savoir Faire

As Miss Gertrude Rennecker of Smithville, Ohio, and her party of adventurers touring the country in their highway-going "yacht" came into the Tower Falls Camp at Yellowstone National Park last summer, they saw a bear-act that almost surpasses belief.

A black mother bear with cubs was just in the act of chasing a brown bear into the woods, evidently for poaching on her particular tourist preserve. He came back immediately, however, but went over to another group of visitors, and began to beg for food. A man and his wife were just opening their lunch kit when he arrived—but they took one look, closed their kit, and moved elsewhere.

Nothing, however, can stop a hungry bear, and Bruin calmly walked up to the table where they were. He threw one leg over the camp bench, then the other, and laid his paws up on the table in a human-like manner as if to say, "Thanks—what's on the menu tonight?". And the way he looked at the campers would have wrung the hardest heart.

Of course, food was immediately forthcoming, and the animal ate all that was given him, while cameras clicked and buzzed. At last, apparently convinced that nothing more could be wheedled out of his human friends, he crawled off the bench and went away. And from his rotundity and satisfied air, Miss Rennecker and her friends were convinced that this bear with savoir faire never lacked for food during the tourist season.

Huge Himalayan Birds

Giant species of Himalayan birds have just been sent from the Himalayan Research Institute to the Roerich Museum by Dr. Walter Koelz, director of the Institute. Among them are the great griffon, known as the king of the mountain birds of prey; the sacred crane of India; the lammergeyer, or bearded vulture, which can fly at one hundred and twelve miles an hour, and the smaller northern and hoopoe. The Himalayan Research Institute is a branch of the Roerich Museum founded by Professor Nicholas Roerich for original scientific study in varied natural history fields.

Secrets of Success

John Bliese writes us from Waterloo, Iowa, that he was sitting at his desk in school one day toward the end of the term "feeling bored" (we've felt that way, too) when he saw a robin out on the lawn pecking away at a prospective meal. John counted eighty-two pecks and figures that at least 120 were made before a luscious worm was captured and disappeared into the robin. John observes that the saying, "If at first you don't succeed, try again," certainly goes with robins. Maybe the inattention to the school lesson wasn't really a waste of time, and perhaps they shouldn't make school windows so high above the floor.

Cocoons for Christmas

Nothing in the insect world is more beautiful than our giant silk-spinning moths, with their brilliant colorings of blues, greens, reds and intermediate shades. It is a beautiful sight to see them emerge from their silk cocoons, with minute wings, which in 20 min. attain full size, 3 to 6 inches.

Special Holiday Prices

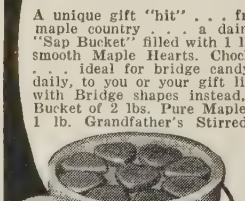
I am daily supplying individuals, clubs, educational institutions, etc., with living silk cocoons from which moths will emerge next Spring, comprising our large moths: Polyphemus, Cecropia, Cynthia, and Promethea, assorted, at these special prices, *before Dec. 31 only*: 6 assorted cocoons for $1.; 12 for $1.75; 18 for $2.25; 28 for $3.50; 55 for $6. Luna moth cocoons 70c each, 3 for $1.85. Automeris Io cocoons 35c each, 3 for $1. In warm rooms some emerge during winter. Emergence guaranteed. On request I will include actual sample wings of 3 of these moths FREE to purchasers ordering 12 cocoons or more. With each order for 18 cocoons or more, *before Dec. 31*, I will include FREE one 70c luna cocoon. Pupae of the rare, red and gold ragalis moth $1.35—3 for $3.60. Pupae of the canary yellow imperialis moth 85c—3 for $2.35. Rare tropical butterflies 70c each, unmounted—six different kinds 60c each; with each order for 6, I will add FREE, *before Dec. 31*, 2 additional tropical specimens. Spread and mounted in glass-topped Riker mounts, 50c additional per specimen.

Ideal for nature study classes, kindergarten, boys and girls nature scout groups, schools, colleges and beauty-loving individuals. Transportation paid. Remit to

C. WM. WURSTER, Suite 1608-AK, 104 Fifth Ave., N.Y.C.

A "Sap Bucket" of real Maple Hearts *direct from Vermont*

A unique gift "hit" . . . fresh from the heart of the maple country . . . a daintily packed natural-wood "Sap Bucket" filled with 1 lb. 5 oz. net of deliciously-smooth Maple Hearts. Chock-full of gift atmosphere . . . ideal for bridge candy or prizes. Mailed fresh daily, to you or your gift list, $1.50 postpaid. Filled with Bridge shapes instead, if preferred, $1.50. Sap Bucket of 2 lbs. Pure Maple Sugar, $1.25; filled with 1 lb. Grandfather's Stirred Sugar, $1; with 1 lb. Assorted Fudge, $1.50 (add 15c per bucket West of Mississippi River). Send for price list of all maple products and dainty confections.



Maple Grove Candies, Inc.
Route 3, St. Johnsbury, Vt.

Special attractive proposition to established dealers.

"Sweetest Story Ever Told"

Solves your Gift Problem

Give your Xmas list a surprise-treat. Send this neat "book" box of natural wood, filled with eight two-ounce cakes of choicest Vermont Maple Sugar, direct from the heart of the maple woods. We mail *promptly* direct to you or your gift list in your name. $1 post paid in U. S. A. (West of Mississippi River add 10c). Write addresses plainly. Price-list all maple products on request.

$1 POST PAID

MT. MANSFIELD MAPLE MERCHANTS
Dept. N
Stowe, Vermont

IT'S *Vermont* MAPLE

PALM RIPENED DATES

3-lb. Redwood box extraordinary dates.... $3.00
5 lbs. dry bread dates 1.75
5 lbs. soft dates..... 2.50
Assorted package..... 1.00

Delivery guaranteed, prepaid

Dates ripened on the palms, possessing the natural sweet and mailed direct to you, have a flavor that will delight you beyond anything you have ever tried. Our dates are just as nature intends them—unprocessed by any artificial method. Order a package today and treat yourself to a new, delightful thrill.

GARDEN OF THE SETTING SUN
DEPT. N, **MECCA, CALIFORNIA**

SHELLS Send one dollar for box of Florida sea shells or send two dollars for a live or a STUFFED ALLIGATOR.

GIFT & PHOTO SHOP
P. O. Box 1958 **Fort Myers, Florida**
Correspondence from Collectors Solicited

(Continued from page 379)

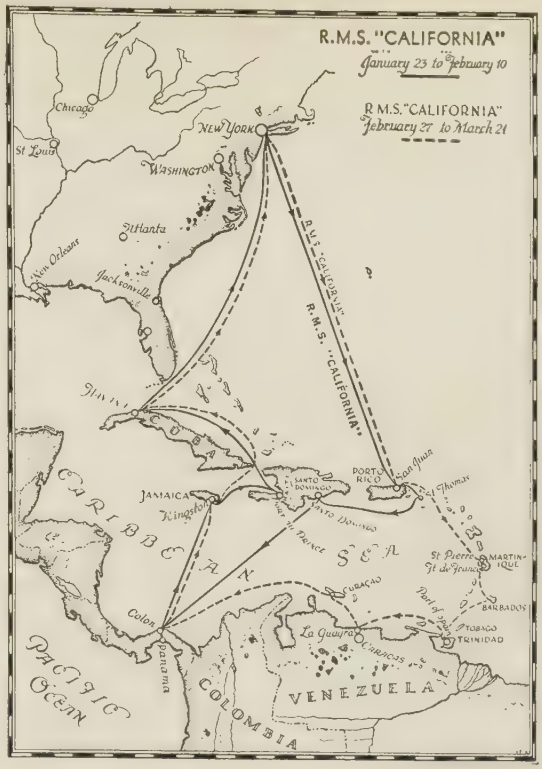
Where the surface only is frozen, it may be opened with a pick. Tulips can still go in with assurance of success. All bulb plantings should be lightly mulched when the ground is frozen. Peat moss or buckwheat hulls are excellent for this.

Your window boxes need not be bare at this season. Several varieties of evergreen such as arborvitae, spruce, pine, hemlock or juniper may be planted in small sizes. One kind only to each box is the best. The entire soil mass should be watered thoroughly and the surface mulched with peat moss. In the spring these plants may be set out in the garden and planted back in the boxes next year. With good care they may be used this way several years. This is a good time to construct new window boxes to be put up next season. Be sure to make them wide and deep enough to contain ample soil. Narrow, shallow boxes dry out quickly and do not hold sufficient soil to nourish plants properly. Ten inches wide and deep should be the minimum, while twelve or even more is not too much.

Newly-planted evergreens should be protected by windbreaks during the winter. The drying winds cause havoc among exposed plants. Burlap may be stretched from strong stakes driven into the ground, or "A" shape barricades made of boards will serve the purpose. Some varieties of evergreen burn badly from the sun and burlap screens prove valuable protection. Another precaution to observe during the winter is not to permit water to drip from the gutters on to your perennial borders. Be sure all rubbish is cleaned from the drainspouts. Where the winters are open and inclined to be wet, care should be used that water does not stand around perennials. Shallow ditches may frequently be dug to carry off any excess.

If you have been troubled by mice girdling your trees or shrubs, do your winter pruning early, leave the branches on the ground and the mice will generally eat their bark in preference to injuring the trees. When you spread manure around your trees and shrubs, avoid getting it near the trunks or stems because it invites mice to winter within it and damage them. This has been especially true with flowering crabs. All mulches should be withheld till the ground is frozen and then there will be less danger of mice infesting them.

Look at your stored dahlias occasionally during the winter. Proper storage conditions mean that they neither rot from too much moisture nor dry and shrivel up from too little. If decay should get started, cut out the bad spots and sprinkle the cuts with sulphur. Seeds saved from your garden must be kept dry over the winter and in a place out of the reach of mice. Stout paper bags or envelopes make ideal containers and each should be plainly marked. Saving your own seed can become an interesting hobby and many amateurs have developed important new strains by careful selection and hybridizing. Success along this line demands a keen sense of discrimination and a firm resolve to discard all things that do not measure up to a high standard.



• • •

The twenty-three day cruise leaving New York February 27 is indicated by the dotted line on the map.

The eighteen-day cruise leaving January 23 is only tentatively scheduled and depends upon interest shown.

• • •

A WINTER TRIP THAT IS DIFFERENT

"What I wanted was a winter vacation with a congenial group," said one of the members of last winter's Nature Magazine Caribbean Cruise. "And I certainly found it."

Others have the same opportunity this year. . . A twenty-three day cruise on the luxurious R. M. S. CALIFORNIA, calling at the most fascinating Caribbean ports . . . Specially-arranged shore trips exclusive to our group . . . Party strictly limited to twenty-five . . . Conducted by a member of our staff intimately versed in the Tropics . . . Excellent medium-priced accommodations forward on C-Deck held for our party . . . Every detail on ship and ashore cared for, even to deck chairs and dining room seating . . . A winter holiday that is an assured success before you start.

All-expense cost about $450 for good, comfortable accommodations . . . Less expensive accommodations available if desired.

Palm Beach Suits in March?...Why Not?

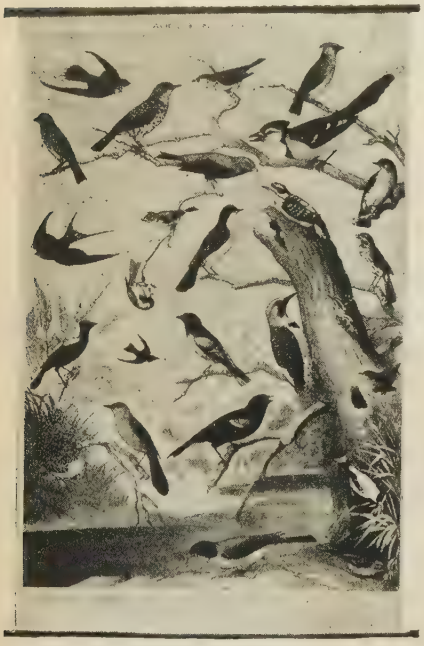
For further information about the Nature Magazine Cruise write to the Director of Field Trips, Nature Magazine, 1214 16th Street, N. W. Washington, D. C.

The Four

Audubon Bird Charts

show 95 birds, life size and *in color.*

Here is No. 1—26 common birds



$2.50 each, $10. the four

A Bird Booklet with each chart, sent anywhere postpaid on receipt of price. A wonderful gift to a child, a home, a school. Descriptive circular free.

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Two books for the price of one

SUTTON'S Amateur's Guide in Horticulture and General Garden Seed Catalogue is sold in the United States for 35 cents. This year we are offering the Catalogue *and* Mr. Leonard Sutton's new book, "Annuals," for only $1. With these two books you can choose from the world's finest varieties of flowers and learn how to grow them to have the best garden you ever had. In the Catalogue this year we describe the vegetables shown by us at the recent Atlantic City Pageant which were awarded the trophy for the best exhibit in the show, special gold medal and other prizes. You will surely want Sutton's Seeds next spring. Send for the two books now. Send International Money Order.

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Trees to be moved by the frozen-ball method should have a trench dug around them now. Go deep enough to get plenty of roots. The ball of soil exposed by digging the trench will soon freeze solid and may then be taken up, set on a platform and moved easily. Extremely large trees require expert handling and elaborate equipment, but smaller sizes may be moved with a minimum of trouble. Old established trees frequently demand the digging of a deep trench one year, cutting through the larger roots, then filling the trench and allowing the tree a year or two for establishing new feeding roots. It may then be moved by the frozen ball method, digging the trench a foot or two outside of where the roots were cut off.

If your lilacs or other trees and shrubs are infested with San José scale, midwinter is the time to spray them with lime-sulphur. The purchase of commercially prepared material is recommended, as the home made product is seldom satisfactory. Follow directions of the makers and remember that in the winter the spray may be used about five times as strong as in summer for leaf and fruit diseases.

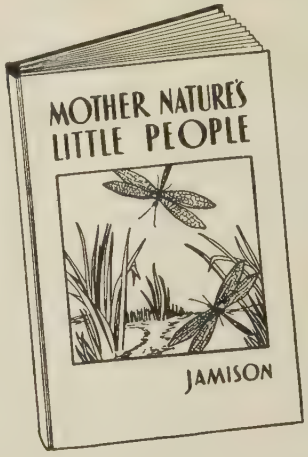
Garden stakes last longer if they are regularly painted, but by all means avoid the abominable practice of painting their tops white. Why the manufacturers of garden stakes persist in this outrageous practice is more than I can tell. The white-topped stakes stand out most objectionably in the garden, spoiling many an otherwise charming picture. Garden furniture should be painted during the winter. Choose a color scheme that will blend and harmonize with the location and use of the furniture. Many desirable pieces are spoiled by improper painting. Repair, sharpen, oil and paint all tools and garden equipment.

With the dry weather so many sections of the country have experienced the last few years, watering the garden has proved quite a problem. Many home owners have installed extensive irrigation systems and they are surely a wonderful help to good gardening. This is a good time to study up on the subject and get prices on the different types. Around the house they should be so installed that they are as inconspicuous as possible. Overhead pipe lines may be fine for the vegetable garden, but they are out of place in the well planned landscape. In lieu of a sprinkling system, plan to run pipes and locate hose connections here and there at strategic points throughout the garden and yard. Dragging a long hose around the yard results in many aggravating accidents. With a well-planned system of piping, fifty feet or less of hose will serve every purpose.

During the long winter evenings the ever-growing class of gardeners dream and plan of the gardens to be. They usually picture far more than their garden will contain. They dream of better color schemes, of more perfect blooms; they vision next year's garden a perfect symphony of color and tone. Maybe it will not quite equal these mid-winter dreams, but they are very worth while just the same. Every real garden was at one time a dream in the mind of someone and without the dreaming it never could have been. So let's dream on and plan for better gardens than ever before. And then let's work to make these dreams come true.

Nature Books for Children

Afford entertaining and instructive reading . . . . Instill a love of nature



Mother Nature's Little People

By Louise Jamison

128 Pages
Full Cloth

72 cents postpaid

This book presents in story form many interesting facts about Nature—the simple whys and wherefores with which every child should be familiar. The stories deal with ants, butterflies, bees, spiders, toads, crickets and many other fascinating creatures. Pen and ink illustrations, many with tinted backgrounds, add interest to the text. Subject matter and vocabulary adapted to children 8 to 10 years of age.

Moths and Butterflies

By Lina M. Johns and May Averill

128 Pages
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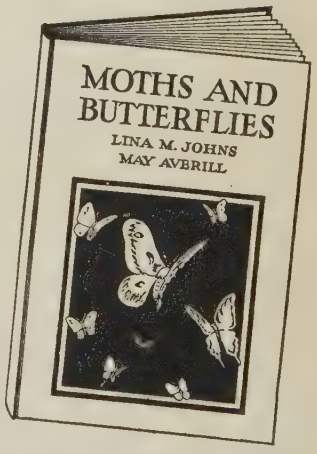
72 cents postpaid



This book tells the life history of 16 common species of moths and butterflies, some of economic importance and all of interest to children. 32 illustrations in two colors, from drawings by Mabel Betsy Hill, give gayety, charm and human interest to the text. In addition there are 33 illustrations from photographs, showing moths and butterflies in their various stages. Subject matter and vocabulary adapted to children 8 to 10 years of age.

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NEW ORLEANS, LA. . . . . The Bienville
TORONTO, ONT. . . . . The King Edward
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WINDSOR, ONT. . . . . The Prince Edward
KINGSTON, JAMAICA, B.W.I. . The Constant Spring

UNITED HOTELS

DISCOVERING COMETS

(Continued from Page 382)

it will set nearly two hours after the sun. It is far over in the southwest in Sagittarius. Jupiter now rises late in the evening, about 9:30 the middle of December, and is a beautiful object in Leo.

Saturn is approaching the sun and sets about two hours after it on the fifteenth. Saturn and Venus will be in conjunction on the nineteenth; Venus will then be due south of Saturn. Mars is in Sagittarius but too close to the sun to be seen this month. Mercury also is in very poor position for observation in December. It reaches greatest elongation east on the 2nd and then sets about one hour after the sun.

On December 22, at 2:30 P.M. Eastern Time, the sun will be farthest south in the constellation of Sagittarius. This will be the beginning of winter in the northern hemisphere and also the shortest day of the year.

COURAGEOUS WIDOWER

By L. G. Treadway

Sometimes we see things in Nature that make us rather ashamed of ourselves as human beings. How few men would have the courage and patience to carry on if they were faced with the difficulties that beset a robin outside my window.

He arrived in early April with his wife and began to frequent a choke cherry tree, apparently with the home seeker's eye. Several changes in the weather, including a first rate snow storm, did not dissuade him from his purpose. Eventually he and his wife contrived a comfortable nest which was nearing completion when a pair of terrible English sparrows made an effort to destroy it. Finally the robins were victorious in the battle and drove away the quarrelsome intruders. Four eggs were laid but before they were hatched, a return of the sparrows, this time four in number, interfered with the peaceful home. The mother robin was injured in the battle and while on the ground was captured by a marauding cat.

Mr. Robin may have been heartbroken, but he did not despair; instead he finished the job of hatching. Three baby robins appeared and for a few weeks Dad was a busy bird. Back and forth from the tree to the lawn with one worm after another to satiate those ravenous appetites. Occasionally he paused to roll the worm in sand from the gravel road, knowing that his children needed teeth for their digestive apparatus. Finally his job was completed and the little birds made the daring take-off and left the nest never to return. The cat that killed their mother will not get them.

I presume the hero of this tale who seems to be away over the week-end will return in a few days with a blushing bride and carry on.

Museums at Glacier

Instead of one museum portraying the geology, glaciers, wild life, flora and history of Glacier National Park, a series of museums will be developed at vantage points in the park, according to an announcement by Dr. George C. Ruhle, Park Naturalist. A trailside museum, probably on the Hudson Bay Divide, is planned to visualize the story of the coming of the pioneers.

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How do *you* KNOW *you can't WRITE?*

Have you ever tried?

Have you ever attempted even the least bit of training, under competent guidance?

Or have you been sitting back, as it is so easy to do, waiting for the day to come some time when you will awaken, all of a sudden, to the discovery, "I *am* a writer"?

If the latter course is the one of your choosing, you probably *never will write.* Lawyers must be law clerks. Doctors must be internes. Engineers must be draftsmen. We all know that, in our times, the egg does come before the chicken.

It is seldom that anyone becomes a writer until he (or she) has been writing for some time. That is why so many authors and writers spring up out of the newspaper business. The day-to-day necessity of writing—of gathering material about which to write—develops their talent, their insight, their background and their confidence as nothing else could.

That is why the Newspaper Institute of America bases its writing instruction on journalism—continuous writing—the training that has produced so many successful authors.

Learn to write by writing

NEWSPAPER Institute training is based on the New York Copy-Desk Method. It starts and keeps you writing in your own home, on your own time. Week by week you receive actual assignments, just as if you were right at work on a great metropolitan daily. Your writing is *individually* corrected and constructively criticized. A group of men with 182 years of newspaper experience behind them is responsible for this instruction. Under such sympathetic guidance, you will find that (instead of vainly trying to copy some one else's writing tricks) you are rapidly developing your own distinctive, self-flavored style—undergoing an experience that has a thrill to it and which at the same time develops in you the power to make your feelings articulate.

Many people who *should* be writing become awestruck by fabulous stories about millionaire authors and therefore give little thought to the $25, $50 and $100 or more that can often be earned for material that takes little time to write—stories, articles on business, fads, travels, sports, recipes, etc.—things that can easily be turned out in leisure hours, and often on the impulse of the moment.

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Why don't you write?

Forestry for Schools

Readers of all ages will, we know, be interested in *Forest Facts for Schools,* written by Charles Lathrop Pack and Tom Gill. It was intended by the authors for a school book, and seems more suitable for this use than any textbook we have yet seen. Undoubtedly the book will be popular with the younger readers because of its dramatic presentation of facts and its graphic illustrations, and its value as a textbook is further increased by the addition of sets of review questions after each chapter to emphasize the more important sections of the text.

But its appeal should be not only to school children. Older readers will be impressed with its concise, easy style and with the broad information contained in the book. It is divided into five units, each unit dealing with one complete subject, and each unit divided into chapters. For instance, the first unit in the book, called "The Tree," is sub-divided into chapters, the first chapter describing trees generally, and the other two describing tree growth and reproduction. There are other units describing the forest, forestry, forest products and forest enemies, and in conclusion the authors have added a chapter outlining the work needed before this country will be on a sound forestry basis.

The authors have been identified with forest education activities for a number of years and have written numerous books and articles on the subject of forestry. Mr. Pack is the President of the American Tree Association and is a member of President Hoover's Timber Conservation Board. Mr. Gill was formerly in charge of the educational activities of the U. S. Forest Service and is now Forester for the Charles Lathrop Pack Forestry Trust, and is a member of the Advisory Committee of the Timber Conservation Board.

A Baynes Book

Back in 1904 Ernest Harold Baynes wrote for the Boston *Evening Transcript* a series of stories on the region of the Corbin game preserve near Lake Sunapee, New Hampshire. These articles have now been gathered, revised and edited by Raymond Gorges and appear in a book entitled *Wild Life in the Blue Mountain Forest.* The book is full of the rich knowledge of and affection for the wild world that has made Ernest Baynes' memory always alive among us. He writes of a region that today is essentially unchanged from what it was nearly thirty years ago. Wild folk, enjoying protection, still abound and among those that may be seen on the Corbin preserve today are descendants of the wild animals of Baynes' book. The publishers are the Macmillan Company, New York, and the book is listed at two dollars.

Our Clothing

There is much Nature interest in *Our Clothing,* an industrial geographical reader appropriate for grades four to six, written by Josephine Worthington and Catherine Victoria Matthews. Well thought out in treatment and thoroughly illustrated, this should find a response in the school world. It is published by the F. A. Owen Publishing Company, Danville, N. Y., and is listed at 96 cents.

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The Chappel Award

We do not know why it hasn't been done before and we applaud the decision of the Chappel Kennel Foundation of Rockford, Illinois, in establishing an annual award to be known as the Chappel Award for Distinguished Service to American Dogdom. This will be in the form of a $250 plaque which both honors the recipient and glorifies the dog. The award will be made to any living American man or woman who has rendered distinguished service in behalf of "man's best friend", whether as breeder, exhibitor, or in securing a greater appreciation for good dogs or in furthering the welfare of dogs. The initial award will be presented in February, 1932, and nominations will close December 31, 1931. A distinguished committee will pass upon the nominations and make the selection. Nominations and all correspondence concerning the award should be addressed to L. J. Brosemer, Director, Chappel Kennel Foundation, Rockford, Illinois.

A National Mineral

We have a national bird, have voted in unofficial polls for a national flower and we always have a national debt, so why not a national rock and mineral? At any rate Mr. Peter Zodac, editor of *Rocks and Minerals,* sees no reason why not and in the September issue of his publication announces a campaign to select both a national rock and a national mineral. Shall the first be granite, marble, limestone, slate, coal, shale or some other rock; or shall the mineral be gold, garnet, quartz, hematite or another? Send your vote to *Rocks and Minerals Magazine,* Peekskill, N. Y., or write to Mr. Zodac for information about the vote.

Names of Plants

Whence came the names of many of our common plants is a question that surely many have asked themselves. To answer this in its entirety would require a tome of great proportions. There are, however, many common plant names which represent a background of botanical lore and are fascinating in their derivation. There attaches, therefore, much interest to *Common Names of Plants* by Willard N. Clute, who has gathered and winnowed some valuable and interesting material in making this book. Mr. Clute is editor and publisher of *The American Botanist,* and, besides being the author of this book, is its publisher. It can be purchased from Mr. Clute, Butler University, Indianapolis, Indiana, for three dollars postpaid.

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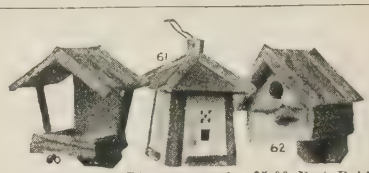

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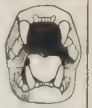

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Aids to Campers

The health, comfort and happiness of outdoorsmen have received a valuable contribution recently by the publication of two booklets on camping and hiking. The first, a complete list of hiking and camping equipment, is published as Bulletin Number 36 by the Potomac Appalachian Trail Club, and is the last word on "going light." It gives the weights, prices and principal firms dealing in articles and clothing for the out-of-doors, and makes valuable suggestions on their use. It may be procured from the Trail Club at the Metropolitan Bank Building, Washington, D. C., for 25c. The other is the Trail Manual for the Appalachian Trail, issued by the Appalachian Trail Conference, and deals with the principles of trail-making, blazing, marking and clearing. Full descriptions of the tools and equipment needed in this work are given. This booklet is priced at 20c, and may be secured from Miss Harlean James, Secretary of the Conference, at the Union Trust Building, also in Washington, D. C.

Nature Scouting

Frequently we receive requests for advice as to how the inquirer can obtain a position with a scientific expedition headed for some far place. There is a lure about such trips and, unfortunately, the opportunities are rare. However, possibly the next best thing would be to read about such trips, and those yearning for the out-of-the-way places can do so most admirably by getting a copy of *To the Ends of the World and Back,* by J. Walker McSpadden. This is a collection of authentic and complete personal interviews with fifteen men who have gone forth from the American Museum of Natural History literally to the ends of the world collecting for that Museum. If you want a story of adventure, danger, daring and allegiance to science, read this book. The Thomas Y. Crowell Company, New York, are the publishers and the book sells for three dollars.

Crow Convention

A meeting of two large flocks of crows that in their actions closely resembled national political conventions was witnessed recently by Edwy E. Benedick of Waterbury, Connecticut. It was being held on the top branches of a tall tree. On the highest limb was a single crow that moved its head up and down and let out a number of "caws" of different degrees of loudness and harshness. Bunched directly below him were thirty or forty others, and on another tree, close by, were about the same number. The two "camps" remained quiet while the single crow cawed; when it stopped, first one group and then the other shrieked at the top of their voices, then flew up and around the tree to come back to the same spot—just as if a nominating speech had been made and the states were parading around at its close. Either the same crow or another one then assumed the rostrum, and the process was repeated, with the whole convention going into an uproar as soon as he finished and then traveling *en masse* around the tree and back again. Had these flocks of crows watched how the American people conduct their democracy?

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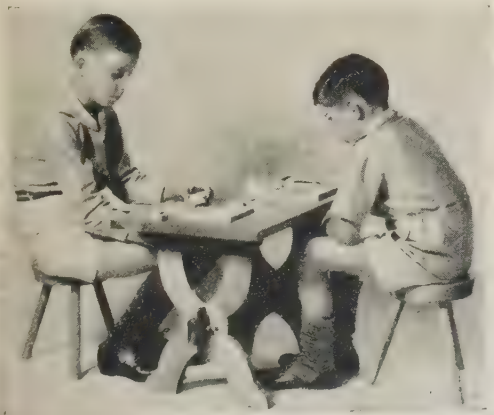

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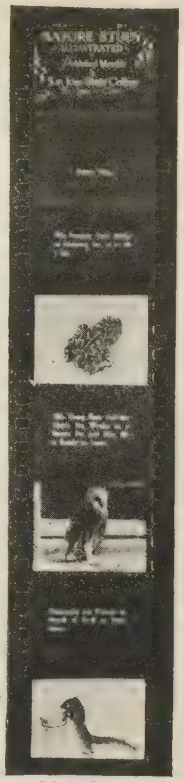

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THE AQUARIUM TRAGEDY

By Mary Ellen Parker

For the last three years we have had an eight-gallon fish aquarium in our General Science room. This year we tried to "balance" the aquarium with plants and animals as nearly as possible. We put about two inches of clean sand in the bottom and two or three water plants with roots. The pebbles, shells, and stones were arranged to hold the roots of the plants in place, and some fish moss, purchased from a fish house, was left floating on the water. The water was always kept within an inch and a half or two inches of the top. Our aquatic pets in our aquarium consisted of three gold fish, one minnow (brought from a pond) one tadpole, and six water snails of two different species.

The last of September or the first of October two small crayfish were placed in the aquarium. The crayfish were very small and we thought they would not be harmful. They hid beneath some of the shells and sand and hibernated for the winter. We saw no more of them until about February 20 when we noticed the long antennae of one of them extending from a large shell in the bottom of the aquarium.

Later in the day we discovered that both of the crayfish were wide awake and one seemed to be guarding the big shell with its big threatening nippers ready to grapple with anything that came within its reach while the other one kept guard of a tunnel or cave of its own making, reaching about one fourth of the way across the aquarium under the shells and pebbles and through the sand. They seemed to be watching to catch the fish or tadpole. Since the fish and tadpole or polliwog were larger than the crayfish we had no thought that the crayfish could do them any harm.

The next day we noticed that the tadpole's tail looked like it had been hurt. We also found a crayfish skin in the aquarium. For you know the growth of a crayfish is like that of an insect; when it has filled its old skin to capacity and cannot grow any more, it breaks open down the middle of the back of the carapace and pulls itself out. The old skin seemed to be perfect in every detail.

That evening before going home, when everything was quiet and only a few students in the room, we were conscious of a terrible struggle in the aquarium. One of the crayfish had the tadpole by the tail and the tadpole, try as he would, could not get loose. We took a pencil and made the crayfish turn loose. We did not take the crayfish out of the aquarium because we thought that experience would be a good lesson to the tadpole and in the future it would stay away from the crayfish. We thought that the tadpole could swim so swiftly there would be no danger of him being caught again.

The next morning we found both the tadpole and minnow dead in one corner of the aquarium. We were afraid to leave the crayfish in the aquarium any longer for fear they might kill the gold fish. We placed them in a gallon battery jar filled with water and gave them some liver to eat. That was on Friday. On Monday morning when we returned to school we found both crayfish dead.

We have often wondered the cause of their death, why the dead tadpole and minnow were both found in the same corner of the aquarium and why the crayfish had killed both of them and then left them seemingly untouched.

From our little experience we have learned not to put crayfish in with other pets.

A PINK LEMON

By Clyde H. DuBose

Of all the horticultural curiosities developed within the borders of the United States, the most outstanding and perplexing of recent years has been announced by the Department of Agriculture: the pink lemon. And those who would have visions of a prosperous pink lemonade industry accruing from the newly-discovered fruit are doomed for disappointment. Government officials hold out no hope for lemonade of any but the ordinary color being made from the decidedly pink juice.

Pink lemons were first exhibited at the National Orange Show this year where it was explained they were developed from a limb variation of the Eureka lemon trees, discovered in 1911. The trees of this variegated Eureka are not as productive as the normal Eureka lemon, and are grown mainly for ornamental purposes.

The new variety bears every resemblance to the mother tree until the fruit begins to ripen which, in approaching maturity, develops a decidedly pink color in the rind, flesh, and juice. Government specialists declare the pink lemon is another illustration of the occurrence of striking bud variations in this variety of citrous fruits.

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The Highland Forest

We confess that the extent of our knowledge of the literature of forests of Scotland just about ended with the thrilling chase told of in the first canto of *The Lady of the Lake*. It appears that we are illy-read for now comes to us a magnificent volume, illustrated in color and black and white, and containing some three hundred and fifty pages of anthology of the Highland Forest. It bears the title *Mine Eyes to the Hills* and is arranged by Patrick R. Chalmers. The illustrations are by V. R. Balfour-Browne. The book is published by the Macmillan Company at six dollars a copy, which would not be too large an investment for any lover of the highlands of Scotland.

Marblehead

New Englanders and those who have visited New England will always remember Marblehead, one of the beauty spots along the Massachusetts Coast. To boatsmen it is "the yachting centre of the world". To painters it represents hundreds of canvases, replete either with beautiful old houses or with the spars and rigging of ships. A brief history of this old town has recently been compiled by Ruth Fearey. Limning as it does the high points in the rise, fall and subsequent rise of Marblehead, it is valuable both to those whose roots go back to the Bay State and those interested in New England development. Copies may be obtained from Miss Fearey at Canandaigua, New York.

About Fish Life

Because it is given only to the Beebes and such like daring gentlemen to observe, life under the sea must always have for the rest of us the allure of the mysterious. We have to be content to read about it and that we can do fascinatingly in *The Romance of Fish Life* by W. A. Hunter. This author writes of the odd fishes in the seas: those that build nests; that migrate long distances; that fight the streams in response to an instinct strong as life itself. The author deals entertainingly with his subject and there is a spice added to the text through the dry humor of the Englishman. The book is published by A. and C. Black, Ltd., of London, and handled in this country by the Macmillan Company. It is listed at $1.50.

The Canada Goose

In a report to the National Museum of Canada, P. A. Taverner, ornithologist, divides the Canada goose family into five distinct groups: (1) A large, light-breasted form breeding across the continent, (2) a large, dark-breasted form breeding on Queen Charlotte Islands and probably in adjoining localities in Alaska, (3) a medium-sized, light-breasted form breeding in the northwest, (4) a small, dark-breasted form said to breed along the coast of the Bering Sea, (5) a small, light-breasted form breeding in the eastern Arctics. This report, which includes further details of observation and life habits, is available as Bulletin No. 67 from Dr. W. H. Collins, Acting Director, National Museum of Canada, Ottawa, Ontario, Canada.

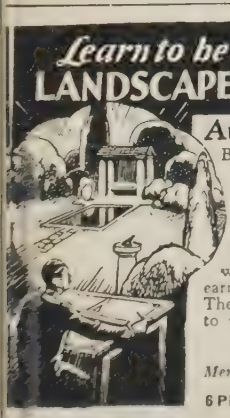
Tame Mourning Dove

Whenever there is any Nature human interest around, you can count on Jim Borland, editor of the Franklin, Pennsylvania, *News-Herald,* to be on hand. In his daily column he recently reported a visit to a pet mourning dove at Sam Borgia's place over Ray Painter's dry cleaning shop. Jim writes:

"About four months ago he picked it off the ground near a garage at the rear of his lot. It did not appear to have suffered an injury of any nature. He took it into his home and fed it. After that it just naturally remained; seemed to be perfectly satisfied with its newly found friends. It became on such intimate terms with all the people in the building that it came and went as it pleased. Every so often it flies away and may be gone from one to three hours. If, upon its return, it alights on the roof of an adjoining house or porch, it responds immediately to the sound produced by the sucking of the tongue in the cheek. Ray says he is afraid, when it comes into his place, it may alight on a red-hot iron, so he has to chase it out, because, he says, they have all become so attached to the bird that they would be lost without it. Some weeks ago it laid half a dozen eggs (when two is the usual number for a Turtle Dove) and set on them, but, of course nothing came of it, as it had not mated and therefore the eggs were not fertile. The question now is whether it will stay for the winter, but, if it does, Mr. Borgia is figuring on fixing a place for it in the enclosed porch."

How Long, O Lord, How Long?

Are the conservation organizations in America fighting a vain fight? The inference that they are is to be derived from a recent bulletin of the Nature Club of Southern California, in which Frank A. Schilling writes: "When will the senseless and unwarranted destruction of our invaluable resources cease; when will our legislators come to their senses and learn that laws other than those making raids on the taxpayers' money must be enacted? Not, I fear, until some major disaster brings home to our consciousness the fact that Nature's balance cannot be upset with impunity." Nature Magazine can well understand Mr. Schilling's pessimism, especially in view of the sportsmen's attitude this year toward the Biological Survey's attempt to save the ducks. Yet we feel that gains are being made, and America may yet arouse herself before Nature must take drastic steps to prove old truths. Perhaps, however, we are only deluding ourselves.



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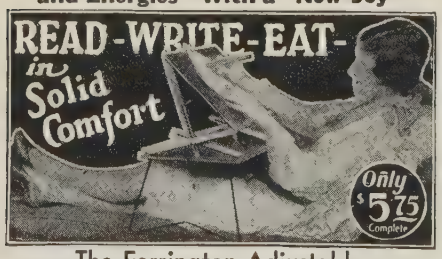

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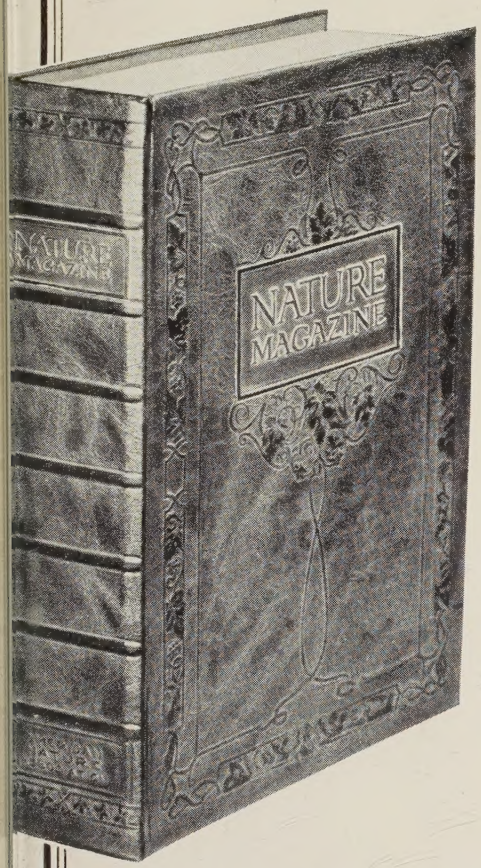

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